

# Honest behavior and Perceived Anonymity in Online Environment

by

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## Abstract

This paper focuses on the honest behavior of people online. It covers the factors that influence this behavior while giving a key role to the concept of *perceived anonymity* that people have while being online. The goal is to investigate what influences the dilemma that humans face while choosing between acting honestly or acting dishonestly. The research considers plenty of factors that influence the honest behavior of people; such as supervision and monitoring, social pressure and physical presence of others. Based on the desk research performed, the background theories are divided into categories; general aspects causing dishonest behavior, anonymity, technology and human interaction, socially accepted and social presence and monitoring and supervision. Next, the experiment is performed and described. Four questionnaires were created, distributed and were answered by 843 people. The first questionnaire served as the control group and the next three included one factor that is manipulated in order to conclude on whether there is a significant relationship between supervision, social pressure, physical presence and honest behavior. Analysis of the results was performed by SPSS. The results showed that the physical presence of others can influence the behavior of people towards being more honest, while the suggestion of supervision and the social pressure is not proven to be significant to influence it. The factor anonymity was the main topic of this thesis and it is also proven to be significant to influence honest behavior. For instance, the people who were anonymous were 14 times more likely to engage in a dishonest act comparing to those who stated their name. Limitations such as the difference between an online and an offline environment, the sample size and financial issues should not be ignored.

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# 1 Introduction

Every day, people make decisions which could influence others, in a beneficial or in a negative manner. Those decisions might be the result of an ethical action, therefore behaving based on rules and procedures without harming anyone else, or an unethical action therefore the opposite behavior. This paper tries to investigate what influences this dilemma that humans face while choosing between acting honestly or acting dishonestly. Mazar, Amir, and Ariely 2008 point out that while turning on the television or reading a newspaper, people are being exposed to at least some kind of dishonesty. Another example of everyday dishonest behavior is the claim of citizens' taxes. People can fill in their tax forms and later get money back from taxes returns or be asked to pay more taxes. It is observed that people lie in those forms in order to be benefited from tax returns. Further, another example given by Mazar, Amir, and Ariely 2008 is that of the overall magnitude of fraud in the U.S. property and casualty insurance industry which is estimated to be 10% of the total claims payments. The examples of dishonest behavior of people could go on endlessly.

As described in the paper of Hoek, Jaspars, and Thijsse 1996, *honesty* is the quality of a proposition which can be said to be only known, i.e. knowing the fact and its consequences, but not knowing more than that. Halevy, Shalvi, and Verschuere 2014 give a frequently used definition of behaving dishonestly which is to intentionally mislead anyone. Dishonest behavior is closely related to lying, there are "small" lies and "big" lies, some are partial truths with some important details made up or excluded and some are completely false claims. Sometimes, lies are obvious and easy to be detected and other times they are subtle. People lie because they have a "good" reason to do so (e.g. protecting a 5 years old child from finding out that Santa Claus does not exist) and some other times people lie because they act in a selfish manner and they want to benefit from the outcome.

The decision to act honestly or not could be influenced by many factors. One of which is *anonymity*, in the sense of having a hidden identity and potentially not having to face charges even if one acts against the rules. Another important aspect which is thought to influence the

(dis)honest behavior is the *social presence* of others while being in the decision making process of choosing to act ethically or not. Further, the example of students during exams, who need to have a supervisor in order to prevent them from cheating highlights the utility of *supervision* in general. Supervision is not examined based on the "physical presence" of the supervisor in the room but based on the fact that the supervisor is closely "watching" the students in order to prevent them from cheating and the potential of punishment if they get caught cheating. One thought is that people might act differently if someone is watching them or supervising them. The idea is also connected with the idea of *social image*. Generally, people want to be approved by other members of the society so their actions should be in line with what is socially approved. For example, in extreme circumstances of inappropriate behavior, people cause an accident that injures people and they abandon them. If others were present in this kind of behaviors, the person who caused the accident might think twice before abandoning the victim as others would probably react and judge negatively that person. Hypothetically then, this person would act differently because of the presence and potential judgement of the "society" which would harm his social image.

Further, most of the interactions nowadays are done or could be done online. Plenty of activities, from playing games to stating your taxes can be done online. Therefore, the enormous change that technology has brought to the way people communicate and behave nowadays can not be ignored. A logical concern is whether people behave in the same way in an offline interaction and in an online one. Questions such as 'Is it easier to cheat while answering a questionnaire online?' or 'Are people more honest when they talk face to face rather than when they hide behind a computer screen?' are some of the topics that this research will cover.

There are plenty of reasons that are considered to influence the (dis)honest behavior of people. The choice of the factors which tested in the experiment are those that were most easily manipulated in an online environment as this paper is concerned with the (dis)honest behavior in an online environment.

In the following section, chapter 2, the topics that the research will cover are mentioned, the goals are presented and the research questions are stated. Then, in chapter 3, the main topics



that this research will cover are extensively described. Later in chapter 4, the experiment is explained in detail. The extensive presentation of the results of the experiment are found in chapter 5. In chapter 6, the discussions and limitations of this research can be found. Finally in chapter 7, conclusions are drawn and research questions that this research are being answered.

## 2 Background

In this chapter, the background and the main topics of this research are presented. The goal is to (i) gain a general understanding of the terms that will be used further, before they are explained in depth in the following sections, and (ii) to get a first impression of what links them together.

The level of honesty of people has been discussed in many researches and it has been proven that there are a lot of factors which could influence/ explain a (dis)honest act. This research's scope is considered with anonymity, physical presence of others, supervision, social pressure and technological factors.

In an attempt to understand the reasons behind the influence that those factors have on (dis)honest behavior, their individual study was necessary. The considerations about the cost-benefit analysis that a person performs while choosing an option over another are listed and analyzed. This category includes the self engagement, the moral balance model, the gain-loss, the need of being socially accepted, the chance of being "ethically blind" and other situational factors that might occur and influence the decision-making process. All these topics will be explained in detail in the following chapters. The personality traits and personal state that an individual might be in when required to decide whether to act honestly or not are also taken into account. *Technology* refers to all the technological changes that have occurred over the past years and have influenced the way people communicate and interact.

*Social presence* is also considered as one of the factors that can push people towards moral or at least more honest acts. *Monitoring* stresses the social presence of others one step further, as the person not only has to feel that others are aware of what he is doing but he will have to face a punishment if caught behaving against the rules. Last, *anonymity* has been proven to be a significant factor that can change the way people act.

Related to technology, a lot of human interaction nowadays is made online. Whether it is about a formal or an informal matter, people often make important decisions through the internet. This is a big change in the way that people used to interact and, based on the combination of

some circumstances, it can lead to a less honest communication. In the following sections the ways that the factors interfere with the decision making process will be analysed and explained.

### 2.1 Scope

The primary goal of this research is to examine and evaluate the honest behavior of people and determine whether perceived anonymity is a factor that significantly affects an individual's honesty in an online environment. The *online environment* that people will be tested, in this research, is participating in a "Game-survey" online.

In this section, the main research question and the sub-questions are proposed. The used approach to find answers for them is also presented further. The sub-questions are formed in a manner which serves as contribution to answer the main research question of this thesis. The answers of the sub-questions and the primary research question will be included in the last chapters. Therefore, the main research question that this thesis addresses is:

*"To what extent does the perceived anonymity influence the (dis)honest behavior of people when asked to claim something online, while other characteristics, such as the physical presence of others or the suggestion of supervision are changed?"*

As previously said, in order to answer the primary research question, it is crucial to answer the sub-questions which are the following:

- (i) *To what extent does the suggestion of supervision (e.g. a pair of eyes) influence honesty online?*
- (ii) *How does social pressure influence the honesty of people online?*
- (iii) *To what extent are individuals comfortable with stating their name while being online?*
- (iv) *How does "being physically alone" while performing a task influence the honesty of people?*

It is considered necessary to gain a better understanding and insight about the the honest behavior of people and the factors that potentially influence them in order to be able to answer the above mentioned sub-questions and the main question. As a result, this thesis presents the

desk research performed on honest behavior and the factors that mostly influence it. It is critical to understand that there are personality characteristics and traits which include ethical beliefs and actions, that can effect the behavior of a person offline as well as online. Besides personality, there are also other things that cause (dis)honest behavior, such as the technological changes that have occurred over the past years and have changed the way people act and interact online. Physical presence of others and monitoring are both considered as strong factors that cause (dis)honest behavior offline and online. Last but not least, being anonymous or the idea of not being traceable can potentially change the behavior of people. This thesis includes a general literature review on the mentioned topics, in an attempt to gain a better understanding of the concepts and their influence on individual behavior.

### 2.2 Research Contribution

In this section, the thesis contribution from a research point of view as well as from society's point of view will be discussed.

From a research point of view, online procedures and anonymity are topics that interest the researches through the years and as seen in chapter 3, a lot of research has already been made on what might influence the behavior of people when claiming something online as well as offline. This thesis aims in taking the existing research one step further by researching the behavior of people online when performing a task while other characteristics, such as the suggestion of supervision and the social judgement are manipulated. Through this, it is aimed to inspire future researchers to dive deeper into the online behavior and its effects together with the online perceived anonymity that people appreciate while surfing the internet.

From society's point of view, this research is inspired from the willingness and preference of people towards lying when asked to claim something online together with the idea of being anonymous/ untraceable therefore, not able to face consequences. When this claims refer to online tax applications or ordering online office supplies, government and companies are "victims" of this lying tendency and lose money over something they cannot control. The goal is to find how this lying behavior can be minimized in order for society to be benefited from the

gains of people actually being honest. Following there is a simple example, it is a fact that nowadays people fill in their tax forms online. If everyone would claim their taxes truthfully, the governments would collect the calculated amount of money returns and therefore they would be able to offer more to the whole society.

### 2.3 Thesis Structure

This thesis is divided into six chapters followed by bibliography. Based on the topics and information that is included, every chapter is divided into sections and subsections which each includes a different subtopic. In chapter 3, the background and prior desk research on the general aspects causing dishonest behavior, Anonymity, Human Interaction, Social Presence, Monitoring and Technology are presented. In these chapters, factors that might influence the level of honesty of people are mentioned and analyzed in order to set the base for understanding the reasons behind the research and the choice of the experiment. In chapter 4, the experimental setting is provided which includes the description of the questionnaires, the platforms used in this research, the distribution of the questionnaires and the data collection methods are explained. In chapter 5, the results of the experiment are presented followed by chapter 6, where the discussion of the results and future work can be found as well as the limitation of the research. Last, in chapter 7, Conclusions are drawn and the answers to the sub-research questions and the main research question are found.

### 3 Background and Related Work

Several researches have been carried out focusing on the topic of honest behavior and the factors that could affect it. Some theories focus on personality, some focus on situational factors and some in both. All of them are presented in the following chapter.

#### 3.1 Research Approach

The aim of this primary research is to collect necessary information concerning the consequences of anonymity on the (dis)honest behavior of people and the characteristics that influence someone's decision making while required to choose whether to act fairly or not. This information will be the base for future research on the topic.

##### 3.1.1 Literature approach

The research is performed online and the literature is mostly collected from the academic sources/ databases: Scopus, ResearchGate and Google Scholar. The material includes other researches, articles, papers, reports and presentations on conferences. Most of the literature collected was published within the last decade, however some remarkable literature that holds and has an impact today as well are included. The materials were written in the English language in order to make it easier for everyone to look up the origin of the information, if needed.

##### 3.1.2 Literature search

The main topics of this research are the (dis)honest behavior that sometimes people choose to engage to, anonymity and its influence on the decision making and other characteristics that influence the moral behavior of people. Those characteristics, as mentioned before, are: the technological changes and options, whether people will face the consequences of their actions when acting in a dishonest manner, the physical presence of someone else in the room who is either just an observer or a monitoring authority and the cost and benefit analysis. Therefore, the search on the mentioned databases was performed by searching these topics or combinations of them. The results were plenty, however, the chosen papers for this research contained the

most suitable and concrete information around the topics.

### 3.2 General aspects causing dishonest behavior

As previously stated, it is possible that the decision making process of an individual might be moderated by certain factors. Further in this chapter, different concepts that describe motivation are presented.

#### 3.2.1 Personality traits

A personality trait is a characteristic that describes the individual in general, independent of the fact that he/she is in a decision-making process. Therefore, traits are personality characteristics that cannot be manipulated. Cobb-Clark and Schurer [2012](#) explain that personality characteristics can be considered as a stable variable in a decision-making process, even though they could potentially change over the years.

McCrae and Costa Jr [2008](#) explain the theory of trait, based on which "Individuals can be characterized in terms of relatively enduring patterns of thoughts, feelings and actions; that traits can be quantitatively assessed; that they show some degree of cross-situational consistency; and so on." and they continue by explaining that traits define a person in general. They state that "Traits point to more or less consistent and recurrent patterns of acting and reacting that simultaneously characterize individuals and differentiate them from others, and they allow the discovery of empirical generalizations about how others with similar traits are likely to act and react."

#### 3.2.2 Moral Balance Model

Another interesting intrinsic model is the Moral Balance Model. This model, lies towards the psychological approach again and suggests that people tend to balance their actions (Jacobsen, Fosgaard, and Pascual-Ezama [2018](#)). Nisan and Kurtines [2013](#) explain that acting in a moral way is a result of the internal moral balance that decision makers manage to gain from 'good' and 'bad' behaviors. Therefore, this paper suggest that when people face the option of acting (dis)honestly, their actions could be justified using the moral balance model. People consider

their moral state based on the actions taken until that point and the state that they will be in when making a certain choice. This model suggests that people could engage in a dishonest behavior as long as their honest actions are more or equal to the dishonest ones. For example, if someone, in general, has engaged in good and moral behavior, he can subsequently chose to act selfishly and engage in dishonest behavior rather than engaging in honest behavior once again as that would lead to a "surplus" (Nisan and Kurtines 2013).

#### 3.2.3 Self-concept maintenance theory

People aim to have a positive self-perception of themselves and believe that they act morally and fairly. The theory of self-concept maintenance falls under this section.

The cost-benefit theory suggest that people who engage in dishonest behavior only care about external benefits. For instance, when a student decides to cheat on an exam, he only cares about getting a higher grade (external benefit) than he would get otherwise. However, as Mazar, Amir, and Ariely 2008 suggest, from a psychological point of view, people value the internal benefits they get from a decision as they aim in creating or maintaining a positive self-image for themselves. The paper's findings support the theory of self-concept maintenance implying that decision-makers are capable of acting dishonestly but to the extent of their internal reward considerations. Also, the findings suggest that people act dishonestly depending on their ability to characterize their action(s) as something other than dishonest. Therefore, based on those findings, the paper suggests that attention should be paid on the personal standards for honesty and the flexibility for categorization.

The described situation can be explained together with the concept of self-serving justifications. As people have to justify their actions to themselves, before and after they make a decision, they perform a pre-violation justification and a post-violation justification. In the end, this concept suggest that if, during the pre-violation justification, the decision-maker fails to justify their dishonest action, they will not engage in dishonesty (Jacobsen, Fosgaard, and Pascual-Ezama 2018).



### 3.2.4 Gain-Loss

This motivation describes the cost and benefit process where the individuals evaluate their gains and losses while making a certain decision.

Researches on online (dis)honest behavior have tried to find the best solution in order to prevent people from cheating. One of the researches that illustrates this conclusion has been carried out from Corrigan-Gibbs et al. [2015](#) who performed an experiment in two different online contexts in order to measure the prevalence of cheating and evaluate methods for deterring it. The outcome suggests that including a stern warning which reminds the user of the potential consequences of cheating helps significantly in lowering the dishonest behavior of people. This can be considered as a reminder of the "losses" that a person will have if he gets caught cheating. This research suggests that the user should be reminded about his losses and realize that his losses, if cheating, are gonna be higher than his gains.

### 3.2.5 Bounded Ethicality and Ethical Blindness

Bounded ethicality and ethical blindness is another reason why people engage in dishonest acts. This motivation to dishonest behavior shall not be ignored as it is a fair explanation to why people act dishonestly. Chugh, Bazerman, and Banaji [2005](#) describe a situation where an individual is unaware of certain ethical norms and breaks them unconsciously (Chugh, Bazerman, and Banaji [2005](#)). As a result, even when adopting a dishonest behavior those people do not experience any hesitation and their self-perception does not change (Gino, Norton, and Ariely [2010](#)).

### 3.2.6 Situational factors and Personal state

As Zimbardo [2004](#) mentions in his research "We should be aware that a range of apparently simple situational factors can function to impact our behavior more compellingly than seems possible." and continues by stating that before anyone blames someone for dishonest behavior or cheating; they should think of the state that this person was in and the possibility that anyone would choose to act the same given the same situational forces.

A state is a characteristic of the decision-maker which is described as temporary. Therefore, this is a characteristic that could possibly be manipulated.

An example of that could be the reference of Kahneman and Tversky 2013 about risk averse people. In their research, they describe what a risk averse person would do when asked to choose between two options, from which one would include a risky option with potentially higher outcomes, and another one with certain prospects. This person would choose the second option as he does not embrace the risk that the first option includes. However, the state that the person was required to make a decision could be characterized by pressure and risk, and it is possible that the same person under different circumstances would make a different choice. Therefore, one could change the characteristics of the "risky" option to make it more appealing to the risk averse person. In contrast, a risk seeking person would choose the risky option because he enjoys taking risks. However, if both choices had the same risk or no risk at all, he would be indifferent in choosing between the two.

### 3.3 Anonymity

Kerr 1999 has studied the effect of anonymity on human behavior. His studies show that there is a connection between anonymity and self-interested actions in essence that through anonymity, people are more likely to cheat or unfairly treat others for their own benefit. In this chapter the importance of anonymity is being stretched.

#### 3.3.1 Definitions of anonymity

Rushed by the former reference to anonymity, following some definitions of anonymity are presented. Anonymity's definition in social sciences differs from its definition in communication research. All of the approaches are covered in the next sections.

#### **Anonymity in Social Sciences**

Within the social sciences, researchers adopt general definitions of anonymity that define it as the state of being unidentified and unknown (Hite, Voelker, and Robertson 2014). Wallace 1999 describes anonymity as "a form of nonidentifiability" which he defines as "noncoordinatability

of traits in a given respect”. He further explains that anonymity was connected with the idea of being un-named which even nowadays still is a key factor to play with when someone should perceive himself as non-identifiable. Names, in fact, can be the key identifier when wanting to find someone but it certainty is not the only one. For example, one can be identified by his social security number. Wallace 1999 considered being unnamed only one part of anonymity and he aimed in researching more kinds of anonymity which manipulate more features of a person.

Marx 1999 claims there are seven definitions of identity knowledge and for one to be completely anonymous, he has to be non-identified according to any of those. Those seven types of identity knowledge are the following: legal name, locatability (location and reach ability in actual or cyberspace), pseudonyms that can be linked to legal names and/or locatability, pseudonyms that can be linked to any other form of identity knowledge, pattern knowledge, social categorization and symbols of eligibility/ non-eligibility.

#### **Anonymity in Communication research**

The definition of anonymity for communication research is slightly different than that of the social sciences. The first emphasizes more on the technical aspects of anonymity than the last.

Pinsonneault and Heppel 1997 give the following definition of anonymity: "the inability of group members to identify the origin of messages they receive and the destination of messages they send" and they state that, in general, "anonymity has been defined very narrowly as the non-identification of participants when, in fact, the literature in social psychology suggests that anonymity is multidimensional and subjective in nature." They continue by stating that anonymity's effects interact with other situational variables, therefore making it hard to evaluate its input in the behavior of people. Gavish and Gerdes Jr 1998 are giving another definition of anonymity where it is viewed as "a composite of three types of anonymity: environmental, content-based and procedural".

Having mentioned multiple definitions of anonymity by different perspectives this proposal continues to the next session by presenting researches that have been done on this topic.

#### 3.3.2 Perceived Anonymity

As said before, Marx identifies seven types of identity knowledge. His definition can be connected with the idea of perceived anonymity. In essence that, even if a person's name is not identifiable and he might have the idea that he is anonymous, there are other factors which can still be available that might give away his identity (Marx 1999). Therefore, his perception of anonymity can be manipulated and his behavior might change while thinking he cannot get caught by cheating, for example.

When it comes to behavior, perceived anonymity is more important than actually being unidentifiable. The most suitable definition of anonymity which is in line with the 'perceived anonymity' concept is that of Hayne and Rice 1997. They explore the social and technical anonymity and further explain the two concepts; Social anonymity is identified as people perceive themselves or others to be deindividuated or unidentifiable while the existence of technical anonymity requires the removal of any meaningful identifying information about a person. Therefore, perceived anonymity involves the idea of individuals being unidentifiable and the idea that their personal identity is unknown to others while in fact might not be the case (Hite, Voelker, and Robertson 2014).

As mentioned earlier, new technologies and online procedures give to the user the impression of being anonymous which is more important than the claim of actually being anonymous when it comes to how the user will behave (Hite, Voelker, and Robertson 2014). In other words, given that a user is identifiable, if somehow he perceives that he is anonymous his behavior might change. A lot of researches have included the concept of perceived anonymity (Gavish and Gerdes Jr 1998), however not many have gone in dept into the concept. Hite, Voelker, and Robertson 2014, conducted one of the studies which tried to formalize a measurement of perceived anonymity. The aim of this study was to create a valid and reliable instrument for measuring perceived anonymity considering the fact that perceived anonymity is not a dichotomous and objective construct and the different contexts in which anonymity may influence the behavior of individuals.

### Levels of anonymity

The theory around anonymity and behavior has been studied for many years. Most of the research done in this topic is experimental and treats 'anonymity' as a dichotomous and objective phenomenon (Hite, Voelker, and Robertson 2014). As a result, under this assumption there is no space for levels of anonymity or discrepancies between actual and perceived anonymity. However, based on the previously mentioned ideas, the thesis tries to investigate whether, in fact, the impression of anonymity can be manipulated and conclude that anonymity is not a dichotomous and objective phenomenon.

### 3.3.3 Further research on anonymity

In contrast with face to face interaction, online interaction gives the opportunity of being more or less anonymous to the other communication party (Nogami 2009) or at least gives the impression of being anonymous. Anonymity has being connected to being untraceable, therefore cannot be found in case a person should be punished. Empirical evidence and experiments have shown that individuals engage in cheating more often when they believe they will not get caught (Hoffman et al. 2015). This is perceived as one of the reasons that participants' behavior changes towards being dishonest or cheat more while communicating through online channels. Plenty of studies over the past years have been concerned with this topic (Cohn, Gesche, and Maréchal 2018, Nogami 2009, Hite, Voelker, and Robertson 2014, Hoffman et al. 2015).

In the study of Cohn, Gesche, and Maréchal 2018, the difference between human and machine interaction is examined. In their experiment, they asked people to flip a coin ten times and note the outcomes on paper; the participants were also asked to be alone while performing the task and were informed that they will stay anonymous as well as the results would be treated confidentially. Based on the outcome of the coin flip which they would report at the end of the experiment, participants could gain some money. This experiment gave the participants the opportunity to cheat as no-one could check the actual outcome of their coin tosses. The experiment implemented four treatments; CALL where participants were reporting their outcomes to the experimenter via Skype, FORM where they could enter their outcomes on an online form,

ROBOT where participants had to report their results to an interactive voice response system with pre-recorded voice messages and finally, CHAT where people reported their outcomes by typing them on Skype. Under this experiment the anonymity of the participants was held constant; the manipulation factor was that participants had to interact with a human or a machine. Based on the fact that the most successful coin tosses were found in the people who reported their outcomes to the online form and statistical analysis, the researchers managed to come up with the following. The results of this experiment showed that participants behaved more dishonestly and reported better outcomes when interacting with a machine rather than with a human being.

To further ensure these findings they performed another experiment which enlightened the question of whether dishonest people prefer to interact with another human being or with a machine. Under this experiment, participants could choose the way they report their outcomes; to the experimenter or to a machine. Participants perceived the two options as equally convenient and the options were equally preferred. However, the experiment showed that people who had more successful coin flips were more likely to choose the online form as a method of reporting their outcomes (Cohn, Gesche, and Maréchal 2018).

Another study which supports that people act differently based on whether or not they are anonymous and rewards is that of Nogami 2009. In this research, the participants identity and rewards were manipulated as independent variables; while the dependent variable was cheating. Participants were given a booklet with the assignment they had to perform. They were asked to flip a coin twice at their home and hand in the booklet to the experimenter's secretary who would also give the rewards to the people who 'won' at the coin toss. The results of this research were similar to that performed by Cohn, Gesche, and Maréchal 2018. They showed that people tend to engage in cheating and act in a self-interest way in order to obtain higher rewards while being anonymous.

Plenty of researches conclude that people act differently when thinking that they are anonymous. For example, Solomon et al. 1981 state that when individuals think that they are anonymous they are more likely to violate norms. Another research with similar results is the one by Rehm,

Steinleitner, and Lilli 1987, which concluded that the lower the identifiability is the higher the chances for behaving against the norm is.

#### 3.4 Technology and Human Interaction

A person is likely to act dishonestly due to the technological changes which influence the way people interact and communicate. Cohn, Gesche, and Maréchal 2018, at their paper 'Honesty in the Digital Age', have considered the changes that technology has brought to human interaction. They examined whether modern online communication options have influenced people's interaction due to its impersonal characteristics. They concluded that people are keen on adopting dishonest behavior or cheat while interacting with a machine (e.g. robot, computer) rather than with another person. They also emphasized on the human interaction as the key to minimize dishonest behaviors.

Current technological inventions enable people to connect and communicate with each another even while being in a far distance. It is a fact that sometimes those communication technologies have completely replaced the "in person" interaction (Turkle 2012). As mentioned before, *anonymity* is considered as a potential reason for a person's dishonesty. The impossibility of being completely anonymous is, in fact, a characteristic of this technological era (Hite, Voelker, and Robertson 2014). However, it is believed that this impression of being anonymous or untraceable could be manipulated and people could be trapped into thinking that they can be completely anonymous when they are surfing the internet (Carvalheira and Gomes 2003). This idea of being anonymous, therefore not blamed for their actions, is the reason why people might change their behavior. The manipulation of being completely anonymous is a topic that will be further investigated with this research.

##### 3.4.1 Robot Presence

Health care, auto-motives, construction, retail, service, manufacturing but also office jobs are only some of the areas that robots have been a crucial operating factors for some years now. Evidence from Industry 3.0 and 4.0 emphasize the robot/ machine presence in personal and professional life of individuals (Liu and Xu 2017). Therefore, it is safe to conclude that robots

have entered our lives to facilitate multiple activities. The efficient use of robots and machines, though, depends also on the honesty of people while interacting with one.

In the research of Hoffman et al. [2015](#), the influence of robot presence on honest behavior of people is examined. An experiment was performed to study the behavior of people while performing a perceptual task (i)alone, (ii)in the presence of a robot and (iii)in the presence of a human. The perceptual task offered the opportunity to the participants to cheat in order to gain higher rewards. The human and the robot were not present to monitor the task; their role was just to serve as 'social presence'. Results showed that people cheated in all three phases; and felt most comfortable cheating while they were alone. Further, they felt less guilty cheating in front of a robot (new expensive social head capable of head movement and screen-based eye animation) than in front of another human. The interesting finding is that the experiment did not find difference in the perceived authority of the human and the robot. The results suggest that individuals' behavior changes towards being more honest when individual(s) or machines are present.

In the same paper, the idea that robots with human characteristics (e.g. eyes) have a higher influence on honesty than non-human looking robots is mentioned (Hoffman et al. [2015](#)). This idea was inspired by the work of Bateson, Nettle, and Roberts [2006](#) who suggested that faces are of high importance in honest behavior implying that they are important while trying to influence individuals towards acting morally.

#### **3.4.2 Camera surveillance**

Van Rompay, Vonk, and Fransen [2009](#) investigated the influence of cameras on people's behavior. They based their study on the fact that human presence can help in increasing honest and moral behavior of others. This idea was expanded with the consideration that a camera, which serves as a watchful eye, might have similar results. Their experiment tested the public helping behavior of people and involved an experimental group, which was made up by people who have been watched from a camera, and the control group, where there was no camera present. The results showed that the group with the camera helped more than the other one and suggest that the



presence of cameras can have positive results on the behavior of people. These results rise from the human need of being approved by others.

#### 3.5 Socially accepted & Social Presence

The factors *socially accepted* and *social presence* are presented together. That is because they are connected, as research has proven, when a person A is together with a person B, person A will more easily engage in an honest act rather than if he would be alone. That is resulted from the fact that people want to behave in ways that are socially and generally accepted in order to avoid judgement or being blamed for unethical behaviors. Facing social judgement would lead to lowering his perception about himself and what others think of him, which is something that people want to avoid.

Based on social sciences, people usually feel motivated by their social image and what others think of them (Cohn, Gesche, and Maréchal 2018). The experiment of Lacetera and Macis 2010 on blood donors examined the way they react to "rewards" after reaching a certain donation quotas. The findings showed that donors made more donations when they were close to reaching the point where they would get a medal. The most important finding, which also supports the social image concerns, is that the increase was only significant when the prizes were publicly announced in local newspapers and medals were given in a public ceremony. Based on this research, it is suggested that social image manipulations are one of the primary motivators of behaving morally and set the publicly announced rewards to be a significant honest behavior motivator.

Further, the research have showed that people tend to act in ways that are socially accepted. This means that while people might have cheated on a game or perform an illegal action while they were alone, this behavior changes when they are in front of one or more people. Therefore, the physical presence of others (being alone or not) can change the behavior of people and lead to more honest and legal actions.

Based on the findings of Hoffman et al. 2015, physical presence of individuals or robots can minimize the unethical behavior of people. They have concluded that when people are with

others, they tend to engage in more honest behavior than if they would be alone. Interesting in this research is that robots also influenced people towards more honest behavior, however, their influence was less effective than the human presence.

Another research on this topic performed the following experiment. Bateson, Nettle, and Roberts [2006](#) placed a pair of eyes above an "honesty box" in a shared coffee room which aimed to serve as monitoring authority. Results showed that even when no physical monitoring authority was there, the pair of eyes was sufficient to increase the moral awareness and minimize dishonest behavior and increase the payments for coffee and tea almost three times compared to when a picture of flowers was above the box.

#### **3.6 Monitoring & Supervision**

In many cases in real life, there needs to be a monitoring authority or some supervision in order for people to behave based on the law or ethically. The reason why there is supervision while students are having an exam is because it is believed and proven that supervision and monitoring reduces cheating or unethical behavior (Hoffman et al. [2015](#)). It is believed that even if students thought about cheating, since there are supervisors present they would avoid it in order not to get caught. This concept has a larger application and holds as well in other settings.

## 4 Experimental Setup

The goal of this chapter is to provide a better understanding of the planning and execution of the experiment and offer a precise description of the way it was distributed and answered. Further, the data analysis programs and tools are also described.

The experiment conducted for this thesis consists of four questionnaires. Those four questionnaires have some common questions and some questions which are used to manipulate different characteristics. The first questionnaire serves as the control group, a simple questionnaire. The second one includes a photo of watching eyes, the third includes a warning which informs the respondent that the overall statistics of the answers will be available to all participants in the end of the questionnaire. Finally, the fourth questionnaire is a combination of the previous two, it includes both the photo and the warning. The questionnaires were distributed and answered by a total of 843 people. The distribution channels and analysis will be detailed described further.

### 4.1 Questionnaires

In order to answer the sub-research questions and the main research question of this research, four questionnaires were created and distributed. The questionnaires start in the same way and only differ in a few details which will be described further.

#### 4.1.1 Description

The characteristics that all questionnaires have in common will be presented first. All questionnaires are identical until the question when the respondents are asked to flip the coin and report their outcome (Heads or Tails). For that reason, the questionnaires are named "*Online Game survey*". There was the need to create some incentive to win/ cheat, therefore, a score-system was created. Every time the coin lands on Heads, the player collects one point. Winners are considered the people who collect seven or more Heads.

The phrase "*Winners are considered the players who managed to get 7 or more "Heads"*" is highlighted in green, which is a colour that is generally preferred by people as it is considered relaxing

and safe (De Bortoli and Maroto 2001). Also, little trophy emojis are placed at the beginning and ending of the sentence in order to emphasize that it is the requested outcome. The word "Tails", which implies the negative outcome is highlighted in red in order to create cautiousness and attention to the players. The part which informs the players about the distribution of the overall statistics is highlighted in orange in order to create the impression that something is about to change and they should be careful.

The introduction of colours in the questionnaires is in line with the research of De Bortoli and Maroto 2001, who have conducted several researches on colours in different countries and results showed that the most preferred colours were blue and green. Experiments showed that blue, green and white are well liked across countries and share similar meanings. Further, the research concluded that red is the most active colour, creates awareness and requires being cautious. Orange belongs in the colours that are described as "hot", "exciting", "active" and "violent", which is the expected feeling when the participants read the warning.

Those characteristics are expected to make "win" more appealing in the eyes of the players and therefore create incentives to cheat. Another thing that the questionnaires have in common is the part which includes demographic questions. Those are necessary in order to be able to describe the respondents.

The first questionnaire will serve as the control group in which the respondents are asked to flip a coin ten times and report the outcome. They are also asked whether they are alone while performing the task and if they wish to state their name/ nickname or keep their anonymity. The other three questionnaires differ than the first one, they include all the questions of the first but have some different characteristics and some additional questions.

The second questionnaire, includes a photo with watching eyes on the question that the respondents are asked to flip the coin. This serves as the *suggestion of supervision*. Later, the respondents are asked to rank how uncomfortable the picture made them feel and are asked to state their opinion on whether or not *supervision* can lead to more honest behavior online.

The idea of including a photo of watching eyes was inspired from the work of Bateson, Nettle,

and Roberts 2006, who have examined the effect of photos of pairs of eyes on contributions to an honesty box used to collect money for drinks in a university coffee room. In that experiment they have used five different photos with different people's eyes and in the end they created a graph which shows which pair was the most powerful. In this experiment, the photo which had the most significant effect was used. Further, all the pairs of watching eyes which were used in the experiment and their effect can be seen.

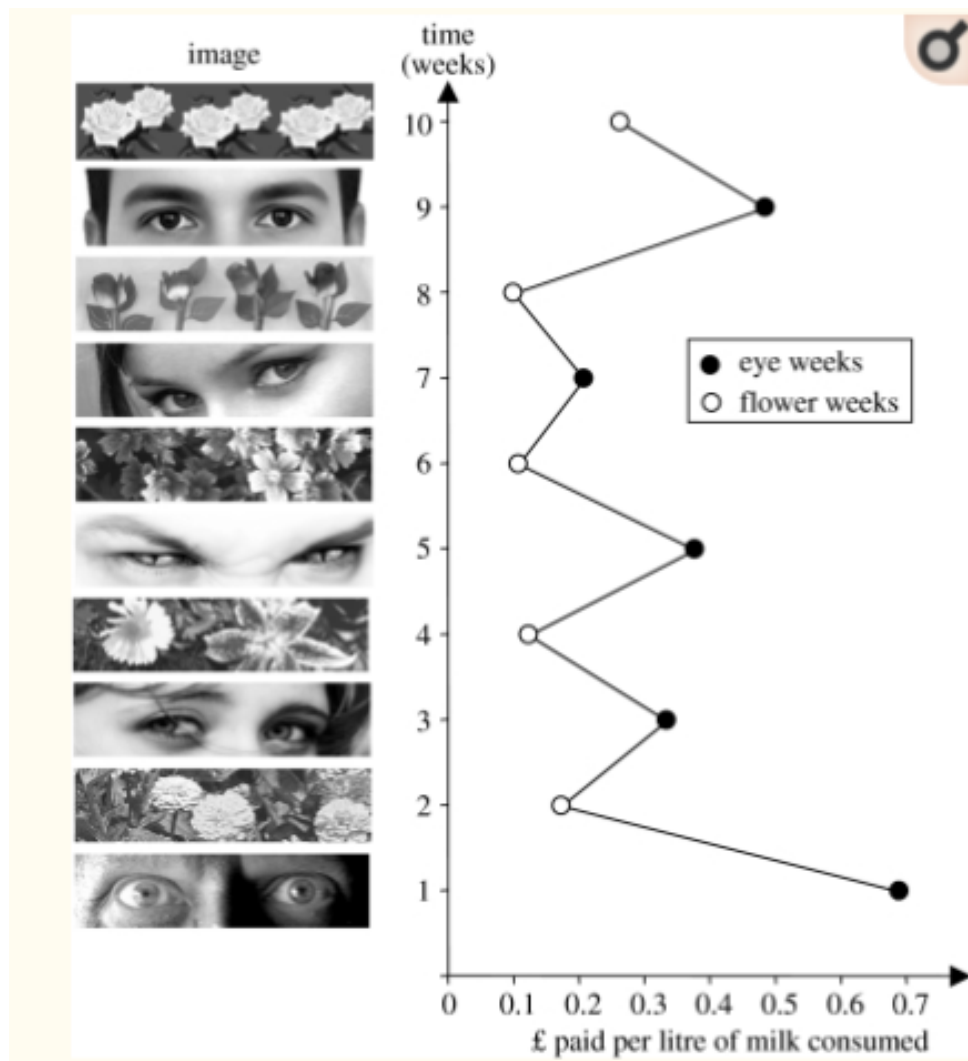


Figure 4.1: Pounds paid by litre of milk consumed as a function of week and image type (Bateson, Nettle, and Roberts 2006)

The third questionnaire is the same as the first but informs the respondents that the overall statistics of the questionnaire can be presented to all participants. This serves as a form of

*social pressure* and the idea of *social judgement*, as cheating is recorder in the overall statistics. This is done by stating the following highlighted in orange "*Note: Keep in mind that the overall statistics of the answers of all participants will be presented to all the respondents.*". The colour orange is picked because it implies warning. This is the feeling that the respondents needed to feel while reading the sentence and being informed about this characteristic. Further, they are asked to rank how uncomfortable the idea of sharing the results made them feel. They are, also, asked to share their opinion on whether or not the idea of *social pressure and judgement* can lead to more honest behavior online.

The fourth questionnaire is a combination of the second and the third. All questions from the second and third questionnaires are included. This means that the focus of the last questionnaire is in both the *suggestion of supervision* and the idea of *social pressure and judgement*. The goal here is to find out whether the *combination of supervision and social pressure* has a higher impact on honest behavior online.

This is believed to be the most appropriate way to test the necessary topics in order to collect useful data to answer the research questions. The questionnaires can be found in the appendix.

### 4.1.2 Distribution

The goal was to send each questionnaire to at least 300 random people and get the highest number of possible answers. There was also a random match between who was answering which questionnaire. The respondents can click on the link that is sent to them and start answering the questionnaire. This makes the distribution of the questionnaire relatively easy if the network used is large enough. Student emails from the University of Twente are used in order to ask students to participate in the questionnaire. Students emails' network was use to send the four links to approximately 15 students per link. Further, since there were no restrictions or conditions in order to be eligible to participate in the questionnaires, personal networks are used to forward the links. Respondents are also encouraged to forward the link to others if they wish to help with the experiment. Young professionals who are working in large corporations helped in forwarding the link to their work's group chats. This way, the questionnaire is directly

exposed to many people at once, keeping in mind that the chats used include more than 100 people on average. For confidentiality and security reasons, the names of the companies that the respondents work for will not be revealed in this thesis.

There was only one restriction to be eligible to answer with the survey and participate in the research, to be 18+ years old.

The exact number of people that the questionnaires were sent to cannot be exact as people were encouraged to forward the link to others if they wished to help with the distribution. However, as stated before, the goal was to send each questionnaire to at least 300 people which was met and the aim was for the highest number of respondents.

### 4.1.3 Data Collection & Analysis

The data collection was done by Qualtrics<sup>1</sup> which is the same program used to create the questionnaire. Qualtrics is a platform which more than half of Europe's top universities use. University of Twente is one of them and as a result this research is done using the Qualtrics platform. Through this platform, the questionnaires were created and they were distributed through the generated link. Not only does the platform offer the opportunity to create a questionnaire but also offers advanced statistical analysis and intelligent features that helps understand and study the results.

The moment a respondent answers a questionnaire the data is saved and recorded by Qualtrics. The data can then be seen and analyzed through the same program (Qualtrics provides graphic representation of answers), or can be downloaded by the researcher and be analyzed with a different program. In this case, the data is downloaded from Qualtrics and is analyzed using Excel and SPSS.

This choice is made because Excel is very user friendly and is suitable for working with this kind of data collection. Through its features, Excel is time efficient while calculating formulas, creating graphs and different kinds of charts, sharing as well as securing information. Also, it is a very helpful tool when formatting is necessary. Most importantly, Excel is able to integrate

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<sup>1</sup><https://www.qualtrics.com/>

with other software such as SPSS, which is used for further statistical analysis of the data.

SPSS is the abbreviation of Statistical Package for Social Sciences and is an efficient tool that offers great opportunities of statistical analysis. It eases the creation of statistical tables and graphs. As said, firstly the data is imported in Excel and then in SPSS. This choice is justified if one considers that Excel is a spreadsheet software and SPSS is a statistical analysis software.

## 4.2 Methodology

In this section, the methodology for the data analysis is described. SPSS was used to perform the statistical analysis from the data obtained after the participants answered the four questionnaires.

### Descriptive Statistics

The first step of the analysis was performed by using the Descriptive Statistics *Frequencies* in order to describe and summarize the data. The Frequencies procedure produced summary measures for the categorical variables in the form of frequency tables and bar charts.

The next step was to perform *Crosstabs* analysis, to describe the relationship between two (or more) categorical variables. Crosstabs' statistics produced associated statistics and measures for each value of the variables, in form of tables and bar charts. Furthermore, using the Crosstab analysis the Chi-Square Test of Independence was displayed for determining whether there is an association between the selected variables.

### Binary Logistic Regression

For answering the research sub-questions and the main research question, Binary Logistic Regression was performed. Logistic Regression is used to predict the probability of a (dichotomous) variable from a set of predictor (independent) variables.

The dependent variable used in this analysis is *Win/ Lose*. As independent variables we defined the following: *Anonymity*, *Alone*, *Watching eyes*, *Available overall statistics*, *Age*, *Gender*, *Education* and their interactions (e.g. *Anonymity\*Age*). The way the variables were coded to enter the regression model(s) is described in the table below.



Variables	Encoding	
<i>Win/ Lose</i>	0	Lose
	1	Win
<i>Anonymity</i>	0	Anonymous
	1	Nickname
	2	Name
<i>Alone</i>	0	Not Alone
	1	Alone
<i>Watching eyes</i>	0	Not in watching eyes condition
	1	In watching eyes condition
<i>Warning overall statistics</i>	0	Not in a statistics condition
	1	In a statistics condition
<i>Age</i>	0	{18-20}
	1	{21-30}
	2	{31-40}
	3	{41-50}
<i>Gender</i>	0	Other
	1	Male
	2	Female
<i>Education</i>	0	High school
	1	Bachelor's degree
	2	Master's degree
	3	PHD or higher
	4	N/A

Table 4.1: Variables coding table

## 5 Results

In this chapter, the results obtained from the carried out experiments are presented. The results are classified and analysed based on the four different questionnaires described in Chapter 4. The structure of this chapter is as follows: first, the explanation of the Bernoulli theorem is explained, after that, descriptive statistics for the demographic characteristics of the four questionnaires and the main results from the questionnaires are presented. Then, the binary logistic regression is explained in detail.

### 5.1 A Bernoulli experiment

In the experiment which was performed in the questionnaires, is described as a random experiment with two possible outcomes. In general, they are called "success" and "failure", and the probability of success is the same in every time the experiment is performed. It is known as the Bernoulli process/ trial. This concept uses the formula presented bellow to calculate the probabilities that are linked to those experiments.

The probability of Heads appearing can be calculated based on the following equation:

$$P(X = x) = C(n, x) \cdot q^{n-x} \cdot p^x$$

where  $x$  is the number of Heads appearing,  $n$  is the number of coin tosser,  $q$  is the probability of Heads,  $p$  is the probability of Tails and  $C(n, x)$  is given from

$$\binom{n}{x} = \frac{n!}{x!(n-x)!}$$

Based on the experiment we have:

$$n = 10$$

$$q = 1/2$$

$$p = 1/2$$

$$P(X = x) = C(10, x) \cdot \left(\frac{1}{2}\right)^{10-x} \cdot \left(\frac{1}{2}\right)^x \xrightarrow{(a^{b_1} \cdot a^{b_2} = a^{b_1+b_2})}$$

$$P(X = x) = C(10, x) \cdot \left(\frac{1}{2}\right)^{10} \Rightarrow$$

$$P(X = x) = \frac{10!}{x!(10-x)!} \cdot \left(\frac{1}{2}\right)^{10}$$

For example, the probability of Heads appearing 6 times is:

$$P(X = 6) = \frac{10!}{6!(10-6)!} \cdot \left(\frac{1}{2}\right)^{10} \Rightarrow$$

$$P(X = 6) = \frac{10!}{6! \cdot 4!} \cdot \left(\frac{1}{2}\right)^{10} \Rightarrow$$

$$P(X = 6) = \frac{5040}{24} \cdot \frac{1}{1024} \Rightarrow$$

$$P(X = 6) = \frac{210}{1024} \Rightarrow$$

$$P(X = 6) = 0.2050 \simeq 20.50\%$$

Heads/ Tails	Calculations	Probability
H=10 T=0	$(1/2)^{10}=1/1024$	0.000976= <b>0.098%</b>
H=9 T=1	10/1024	0.00977= <b>0.98%</b>
H=8 T=2	45/1024	0.0439= <b>4.39%</b>
H=7 T=3	120/1024	0.117= <b>11.7%</b>
H=6 T=4	210/1024	0.2050= <b>20.50%</b>
H=5 T=5	252/1024	0.2461= <b>24.61%</b>

Table 5.1: Probabilities of coin tosses

Based on this, the thesis bases its conclusions in order to support and prove that participants, in some cases, have cheated. For instance, as it can be seen from the table, the expected probability of winning is  $17.168\% = (0.098\% + 0.98\% + 4.39\% + 11.7\%)$ . This, automatically means

that 82.832% is expected to lose. In this game, the outcomes are Win or Lose, there is no other possible outcome. For instance, the results of the first questionnaire showed that 47.32% has won. Therefore, since the expected probability of winning is 17% and the actual winning percentage for the first questionnaire is 47%, it can be concluded that at least some of the participants who won have cheated.

### 5.2 Descriptive Statistics

Following, the descriptive statistics results from the demographic characteristics of the four questionnaires and the general results from the four questionnaires are presented.

#### 5.2.1 Demographic characteristics of the four questionnaires

In this chapter, the demographic characteristics of the four questionnaires are presented. The following table was created to combine the output of all the questionnaires for the total number of participants which is 843.

## 5 RESULTS

<i>Demographics</i>	<i>Q1</i>		<i>Q2</i>		<i>Q3</i>		<i>Q4</i>		<i>Total</i>
<i>Gender</i>	Count	%	Count	%	Count	%	Count	%	
Male	138	67.3%	124	62%	136	61.5%	106	48.8%	504
Female	37	18%	76	38%	72	32.6%	99	45.6%	284
Other	20	9.8%	0	-	0	-	0	-	20
Prefer not to say	10	4.9%	0	-	13	5.9%	12	5.5%	35
Total	<b>205</b>	100%	<b>200</b>	100%	<b>221</b>	100%	<b>217</b>	100%	
<i>Age</i>									
11-20	42	20.5%	20	10%	91	41.2%	39	18%	192
21-30	100	48.8%	126	63%	73	33%	108	49.8%	407
31-40	63	30.7%	30	15%	47	21.3%	47	21.7%	187
41-50	0	-	24	12%	10	4.5%	23	10.6%	57
Total	<b>205</b>	100%	<b>200</b>	100%	<b>221</b>	100%	<b>217</b>	100%	
<i>Education</i>									
High-school	29	14.1%	80	40%	43	19.5%	61	28.1%	213
Bachelor's degree	73	35.6%	48	24%	86	38.9%	69	31.8%	276
Master's degree	55	26.8%	36	18%	57	25.8%	74	34.1%	222
PHD or higher	5	2.4%	36	18%	4	1.8%	4	1.8%	49
Prefer not to say	43	21%	0	-	31	14%	9	4.1%	83
Total	<b>205</b>	100%	<b>200</b>	100%	<b>221</b>	100%	<b>217</b>	100%	
<i>Continent</i>									
Europe	166	81%	174	87%	162	73.3%	191	88%	693
America	14	6.8%	6	3%	14	6.3%	16	7.4%	50
Australia	4	2%	0	-	0	-	0	-	4
Asia	0	-	0	-	29	13.1%	7	3.2%	36
Africa	0	-	0	-	0	-	3	1.4%	3
Prefer not to say	21	10.2%	20	10%	16	7.2%	0	-	57
Total	<b>205</b>	100%	<b>200</b>	100%	<b>221</b>	100%	<b>217</b>	100%	

Table 5.2: Demographics

Those were the results collected for the demographic characteristics of the sample.

### 5.2.2 Results from questionnaires

The outcomes of the questionnaires are presented in this chapter. For each mentioned topic, there will be the presentation of the four questionnaires together. For instance, in the following table the overall percentage of people who won and lost is seen for each questionnaire. Further, the results will be presented with the use of graphs and tables as well as explanations for better understanding.

<i>4 Questionnaires</i>	<i>Win or Lose?</i>	
	<i>Win</i>	<i>Lose</i>
<b>Questionnaire 1</b>	47.32%	52.68%
<b>Questionnaire 2</b>	42%	58%
<b>Questionnaire 3</b>	44.34%	55.66%
<i><b>Questionnaire 4</b></i>	38.25%	61.75%

Table 5.3: 4 Questionnaires - Win or Lose?

It is important to note that the second questionnaire had the additional characteristic of the picture with the watching eyes. In this section, the attention is at the experimental group where "watching eyes" are used to test the impact of suggestion of supervision. In order to identify the strength of the influence, some opinion questions were added. The first one asked the participants' to rank whether people would be more honest in the experiment if someone was supervising them. The majority of people answered positively. The answers are visualized in the appendix in figure [A.8](#).

The difference of the third questionnaire is the addition of the warning phrase "Note: Keep in mind that the overall statistics of the answers of all participants will be presented to all the respondents". The goal in this questionnaire was to test whether the social pressure and potential judgement has a significant effect on the online behavior of the participants.

The fourth questionnaire is a combination of the previous two. It includes the picture of the

”watching eyes” and the warning phrase ”Note: Keep in mind that the overall statistics of the answers of all participants will be presented to all the respondents”. The goal in this case was to test whether the combination of the two characteristics has a more significant effect on the online behavior of the participants. The aim in the end is to be able to state whether the combination of supervision and social pressure has a stronger effect than each of them separately.

Participants were asked if they were alone while answering the questionnaire and whether they preferred to be anonymous, state a nickname or state their name. The results of the four questionnaires can be seen in the next tables.

Questionnaire 1	Control Group
<i>Alone</i>	68.29%
<i>Not alone</i>	31.71%
<i>Anonymous</i>	68.3%
Name	22%
Nickname	9.7%

Table 5.4: Questionnaire 1 - Control Group

Questionnaire 2	Watching eyes
<i>Alone</i>	64%
<i>Not alone</i>	36%
<i>Anonymous</i>	70%
Name	20%
Nickname	10%

Table 5.5: Questionnaire 2 - Watching eyes

Questionnaire 3	Warning overall statistics
<i>Alone</i>	52%
<i>Not alone</i>	48%
<i>Anonymous</i>	76.48%
Name	14.48%
Nickname	9.04%

Table 5.6: Questionnaire 3 - Warning overall statics



Table 5.7: Questionnaire 4 - Interaction: Eyes\*Warning overall statics

Questionnaire 4	Interaction: Eyes - Overall statistics
<i>Alone</i>	58.1%
<i>Not alone</i>	41.9%
<i>Anonymous</i>	79.7%
Name	15.7%
Nickname	4.6%

Table 5.8: Questionnaire 4 - Interaction: Eyes\*Warning overall statics

Some important results are presented in the next tables. These tables show the percentage of people who were alone and the percentage of those who were not alone and whether they won or lost. Also, they include the people who kept their anonymity and won as well as the ones who lost, the percentage for the people who stated a nickname and won and the ones that lost and the percentage of people who stated their name and won and those who lost. Again, four tables are seen, each one is created for one questionnaire.

<i>Questionnaire 1</i>	<i>Control Group</i>	
	<i>Win</i>	<i>Lose</i>
<b>Alone</b>	36.59%	31.71%
<b>Not alone</b>	10.73%	20.98%
	<i>Win</i>	<i>Lose</i>
<b>Anonymous</b>	36.59%	31.71%
<i>Name</i>	0.98%	8.78%
<i>Nickname</i>	9.76%	12.20%

Table 5.9: Questionnaire 1 - Control Group/ Alone &amp; Anonymity &amp; Win or Lose

<i>Questionnaire 2</i>	<i>Experimental Group - Watching eyes</i>	
	<i>Win</i>	<i>Lose</i>
<b>Alone</b>	33.50%	30.5%
<b>Not alone</b>	8.5%	27.5%
	<i>Win</i>	<i>Lose</i>
<b>Anonymous</b>	36%	34%
<i>Name</i>	-	10%
<i>Nickname</i>	6%	14%

Table 5.10: Questionnaire 2 - Experimental group/ Alone &amp; Anonymity &amp; Win or Lose

<i>Questionnaire 3</i>	<i>Experimental Group</i> - Warning	
	<i>Win</i>	<i>Lose</i>
<b>Alone</b>	28.51%	15.84%
<b>Not alone</b>	23.53%	32.13%
	<i>Win</i>	<i>Lose</i>
<b>Anonymous</b>	35.29%	41.18%
<i>Name</i>	-	9.05%
<i>Nickname</i>	9.05%	5.43%

Table 5.11: Questionnaire 3 - Experimental group/ Alone &amp; Anonymity &amp; Win or Lose

<i>Questionnaire 4</i>	<i>Experimental Group</i> - Combination	
	<i>Win</i>	<i>Lose</i>
<b>Alone</b>	25.81%	12.90%
<b>Not alone</b>	32.26%	29.03%
	<i>Win</i>	<i>Lose</i>
<b>Anonymous</b>	29.49%	50.23%
<i>Name</i>	0.46%	4.15%
<i>Nickname</i>	8.76%	6.91%

Table 5.12: Questionnaire 4 - Experimental group/ Alone &amp; Anonymity &amp; Win or Lose

These tables can help in the understanding of how being alone and anonymity can influence the behavior of people. As stated it is believed that the percentage of people who won is a result of honest and dishonest behavior. This means that some of the participants who won, have cheated.

Those were the raw results from the first questionnaire based on the questions that were asked. Further in this chapter there are statistical analysis about them. For more detailed results, one could look at the appendix.

### 5.3 Binary Logistic Regression

In order to be able to test whether the variables used in the experiment have a significant effect on honesty, a binary logistic regression analysis is performed. The multivariate logistic regression which is used in this experiment, is an extension of simple binary logistic regression where more than one different independent variables are used to predict the value of the dependent variable. At this point, it should be mentioned that the threshold level is arbitrary and it is up to the reader to decide which value the alpha could take. The level of alpha does not change the results, it only changes the interpretation of them. As the most commonly used alpha is 5%, this is the level that will be used to judge the outcomes of the regression in this thesis. Below the three different models of the regression are described.

#### 5.3.1 Dependent and Independent Variables

The variables used in the analysis were categorized based on their role as *dependent* and *independent*. An independent variable is a variable that is altered and/or controlled in a statistical analysis to test the effect on the dependent variable that is being examined. In other words, the value of the independent variable is controlled by the researcher, or by the participants in this research, while the value of the dependent variable only differs with respect to the independent variable.

The variables that are defined as independent were: *Anonymity*; whether the participant kept his/ her anonymity or stated a nickname or name, *Alone*; whether the participant was alone or not during the survey, *Watching Eyes*; whether people answered a questionnaire which included the picture of watching eyes or not, and *Warning about overall statistics*; whether people answered a questionnaire which included the warning phrase that the overall statistics will be available to all the participants or not. The dependent variable in the analysis is the *WIN/Lose* variable. All the other variables (gender, age and education) are also specified as independent

variables for the logistic regression. These are characteristics of the participants and in some case can affect the outcome.

### 5.3.2 Binary Logistic Regression with the main predictors

This model has as Independent variables the four main variables: *Anonymity*, *Alone*, *Watching eyes*, *Warning overall statistics*, *Eyes\*Overall statistics* and as Dependent variable: *Win/ Lose*.

The Classification Table 5.13 shows us that this model allows us to correctly classify 212 / 363 = 58.4% of the subjects, where the predicted event (winning the experiment) was observed. We also classified correctly 308 / 480 = 64.2% of the subjects, where the predicted event was not observed. Overall our predictions were correct 520 out of 843 times, for an overall success rate of 61.7%.

<i>Observed</i>		<i>Predicted</i>		
		Lose	Win	Percentage Correct
Win/ Lose	Lose	308	172	64.2
	Win	151	212	58.4
Overall %		61.7		

Table 5.13: Classification table

By looking at the results of the logistic regression analysis (table 5.14), and specifically at the p-values (**Sig.** column) of the estimated coefficients, it is observed that not all the coefficients are statistically significant. This means that only a subset of the predictors are related to the outcome. It is concluded that the factors *Anonymity Alone* are the only factors which significantly influence the dependent variable. The values for *Anonymity* and *Alone* are smaller than 0.05 which proves that these factors influence honest behavior of people.

Next, there are the factors that are not significant in this model. The factors *Watching Eyes* and *Warning overall statistics* have the values 0.282 and 0.862 respectively. By comparing those values to alpha (0.05), it is concluded that both variables do not significantly influence the honest behavior of people. In this analysis, an interaction variable was also tested for its significance.

The interaction variable was the combination of the *Watching Eyes* and the *Warning overall statistics* variables, referring to the participants of the Questionnaire 4, and with the value of 0.664, it was proven not to have a significant effect on the honest behavior of people either.

	<b>B</b>	<b>Sig.</b>	<b>Exp(B)</b>
<i>Anonymity</i>		.000	
<i>Anonymity (1) - Anonymous</i>	2.684	.000	14.649
<i>Anonymity (2) - Nickname</i>	2.859	.000	17.448
<i>(Ref. group: Name)</i>			
<i>Alone</i>	.680	.000	1.973
<i>Watching eyes</i>	-.226	.282	.797
<i>Warning overall statistics</i>	-.036	.862	.965
<i>Interaction eyes_overall stats_Q4</i>	-.126	.664	.881

Table 5.14: Logistic regression - Variables in the Equation

### 5.3.3 Binary Logistic Regression with demographics

This binary logistic regression includes as predictors the demographic characteristics. For this analysis there are no expectations about the outcome. Since the desk research does not include those as topics that might influence the honest behavior of people. The demographic characteristics were collected in order to be able to describe the sample. However, since they are already collected, it is interesting to test whether those characteristics can statistically affect the value of the dependent variable.

This regression model includes only the demographic characteristics (age, gender and education) as Independent variables and the Win/ Lose as Dependent variable. The Classification Table

5.15 from SPSS shows us that this model allows us to correctly classify  $131 / 363 = 36.1\%$  of the subjects, where the predicted event (winning the experiment) was observed. We also classified correctly  $377 / 480 = 78.5\%$  of the subjects, where the predicted event was not observed. Overall our predictions were correct 508 out of 843 times, for an overall success rate of 60.3%.

<i>Observed</i>		<i>Predicted</i>		
		Lose	Win	Percentage Correct
Win/ Lose	Lose	377	103	78.5
	Win	232	131	36.1
Overall %		60.3		

Table 5.15: Classification table

From the results of the logistic regression analysis (table 5.16), it is concluded that *Age (31-40)*, *Education - PHD* and *Education - Prefer not to answer* can significantly predict the dependent variable, comparing these categories to their relevant reference groups. The values for these variables are smaller than 0.05 which proves that these factors influence honest behavior of people.

The rest of the categories of the *Age* and *Education* variables, as well as *Gender* are factors that are not statistically significant in this model and do not have a significant effect on the honest behavior of people.

	<b>B</b>	<b>Sig.</b>	<b>Exp(B)</b>
<i>Age</i>		.000	
<i>Age (21-30)</i>	-.128	.515	.880
<i>Age (31-40)</i>	-1.288	.000	.276
<i>Age (41-50)</i>	.472	.154	1.603
<i>(Ref. group: Age (18-20))</i>			
<i>Gender</i>		.783	
<i>Gender (1) - Other</i>	-.163	.600	.850
<i>Gender (2) - Male</i>	-.103	.545	.902
<i>(Ref. group: Female)</i>			
<i>Education</i>		.000	
<i>Education (1) - Bachelor</i>	.085	.656	1.089
<i>Education (2) - Master</i>	.100	.655	1.105
<i>Education (3) - PhD</i>	-1.705	.001	.182
<i>Education (4) - Prefer not to answer</i>	.695	.012	2.003
<i>(Ref. group: High-school)</i>			

Table 5.16: Logistic regression - Variables in the Equation

### 5.3.4 Binary Logistic Regression with main predictors and demographics

The following analysis presents the logistic regression model including both the main variables (predictors) and also the demographics. It is a combination model between the previous two analyses.

By looking at the results of the logistic regression analysis (table 5.17), and specifically at the p-values (**Sig.** column) of the coefficients, it is observed that the variables that are statistically significant are the same variables that were significant also during the previous analyses.



	B	Sig.	Exp(B)
<i>Anonymity</i>		.000	
<i>Anonymity (1) - Anonymous</i>	2.629	.000	13.861
<i>Anonymity (2) - Nickname</i>	2.972	.000	19.521
(Ref. group: Name)			
Alone	.621	.000	1.861
Watching eyes	-.165	.516	.848
Warning_overall statistics	-.242	.286	.785
<i>Age</i>		.000	
<i>Age (21-30)</i>	-.105	.673	.900
<i>Age (31-40)</i>	-1.090	.000	.336
<i>Age (41-50)</i>	.584	.106	1.793
(Ref. group: Age (18-20))			
<i>Gender</i>		.162	
<i>Gender (1) - Other</i>	-.574	.087	.563
<i>Gender (2) - Male</i>	-.279	.152	.756
(Ref. group: Female)			
<i>Education</i>		.000	
<i>Education (1) - Bachelor</i>	.214	.302	1.238
<i>Education (2) - Master</i>	.264	.271	1.302
<i>Education (3) - PhD</i>	-1.929	.000	.145
<i>Education (4) - Prefer not to answer</i>	.661	.032	1.936
(Ref. group: High-school)			
<i>Interaction eyes_overall stats_Q4</i>	-.200	.538	.819

Table 5.17: Logistic regression - Variables in the Equation

However, what is remarkable in this logistic regression model is the overall success rate of 68.6% (578 out of 843 times correct prediction). This is an important increase comparing to the previous models that they predicted correct value in 61.7% and 60.3%.

<i>Observed</i>		<i>Predicted</i>		
		Lose	Win	Percentage Correct
Win/ Lose	Lose	328	152	68.3
	Win	113	250	68.9
Overall %		68.6		

Table 5.18: Classification table

#### 5.4 Conclusions of Results section

In this chapter the results of the four questionnaires were presented together with the results of the binary logistic regression analysis. Three logistic regression analyses were performed. The last one (Table 5.17) which included the demographics and the main predictors will be used to draw conclusions and answer the research questions. No comments or conclusions were included as these will be included in the last chapter, 7. The aim of this chapter was to present the results as simple and understandable as possible with the use of graphs and tables and the text explanations. Having the results clear in mind, one can continue with the 6.1 where the meaning of the results is analysed and explained. This will then lead to having a natural end with the conclusions and answers to the thesis's research questions.

## 6 Discussion, Limitations & Future work

The discussion of the results are presented further. General results and conclusions which can be drawn from all four questionnaires will be included as well as separate outcomes which are revealed from each questionnaire.

### 6.1 Discussion

In this chapter, general results which are withdrawn from all questionnaires will be discussed. Further, separate discussion about each questionnaire's results will be included.

The *most important result* of the experiment was whether participants won (had 7+ "Heads" or lost (had less than 7 "Heads"). In order to achieve better understanding between the outcomes of the "game" (Flip a coin) that participants were asked to play and the actual probabilities of this game, the following explanation is made. The experiment was able to be tested for its accuracy based on the probabilities of the Bernoulli's experiment which is extensively explained in the previous chapter. Based on this, the probability of flipping a coin 10 times and getting 7 or more times "Heads", therefore winning, is approximately 17%. In the first questionnaire, 47.32% has won, in the second one 42%, in the third 44.34% and in the last 38.25%. Those were the results of the Win/ Lose question that was the same in all questionnaires.

Based on the literature review which has been performed, some explanations about the results can be given. As expected, based on the theoretical framework, a lot of participants have cheated. Many reasons could explain this outcome. First of all, the fact that it is an online experiment could have influenced the participants. It is perceived very differently to perform a task online versus offline. The online nature of the experiment of this thesis is considered as one of the variables that lead to the high percentages of winning.

Secondly, there are multiple factors which are considered to influence the behavior of people online and have been tested in this experiment. For example, one question included the physical presence of others while someone was answering the questionnaire. The physical presence of others can lead to more honest results. In other words, if people are not alone they would cheat

less. This is supported from the literature but also from the results of the questionnaires and the logistic regression analysis. In all four questionnaires, people were asked if they were alone or not. Most of the people who were alone, won while when there was at least one other person in the room, most people lost. The output of the binary logistic regression has shown that the b coefficient for the "Alone" variable is significant and positive, indicating that being alone is associated with increased odds of winning. Looking at the **Exp(B)** (Odds Ratio) column of the Table 5.17, we can see that those who are alone, are 1.86 times (or 86%) more likely than those who are not alone to win. Therefore, physical presence of others is considered as another strong factor which affects the results of winning.

Third, based on the literature, anonymity was a factor which was expected to be of great importance for this thesis. Previous researches have suggested that anonymity leaves room for dishonest behavior and cheating. By looking at the results of each questionnaire separately, it would be concluded that anonymity influences honest behavior. In all four questionnaires, the majority of people chose to stay anonymous. The percentage of the people who choose to keep their anonymity and won is higher than the expected winning percentage. Also, people had the option of stating a nickname, which served as a middle stage between completely anonymous and stating their name. Again, the percentage of people who stated a nickname and won is higher than the expected winning percentage. The third option was to state their name. Most of the people who made this choice, have lost. Interesting to note is that most of the people preferred to keep their anonymity rather than state a nickname or their name. This can be justified also from a statistical point of view based on the logistic regression analysis. We saw in Table 5.17 that those who preferred to remain anonymous during the experiment (Anonymity (1) - Anonymous) were significantly more likely than those who stated their name to win ( $\text{Exp(B)}=13.861$ ), after controlling for the variables. The same for the group who stated a nickname (Anonymity (2) - Nickname). They are 19.521 times more likely to win the game comparing to those who stated their name real name. The effect of these two groups is significant and positive (p-values < 0.05). It can be concluded that anonymity is another reason why the total number of people who won in this experiment was that high. Therefore, it can be generally stated that based on

this research, *Anonymity* has a significant influence on *honest behavior*.

The fourth factor that lead to the high number of winning cases is that people knew that there cannot be any charges against them if they cheat. Literature suggests that people are more honest when they know that they can get caught if they cheat and they have to face consequences. In this experiment, the consequence would be to be exposed to the rest of the people who answered the questionnaire. Personal sensitive data protection rules did not allow to track and point out the people who cheated; this was considered as a more effective way to manipulate "consequences". Even though, the questionnaire which included the warning had a lower percentage of winning, and the output of the logistic regression analysis showed that the participants from the questionnaires without the warning were 1.27<sup>2</sup> times more likely to win, there is not a strong enough relationship between that variable and winning. As a result, it cannot be concluded that the warning has a significant effect on the honest behavior of people.

One of the methods used in this research was to ask opinion questions in the end of the second, third and fourth questionnaires; which served as the experimental groups. For example, the second and fourth questionnaire which included the picture of watching eyes, also included the question "Do you think that people would be more honest in the experiment if someone was supervising them?"; and the possible answers were: "Definitely yes", "Probably yes", "Might or might not", "Probably not", "Definitely not". Most of the participant answered positively in those questions which suggests that supervision has a positive effect on honest online behavior. The Third and fourth questionnaire which included the warning about the results, included the following opinion question: "Do you think that people would be more honest in the experiment if they would be facing potential social exposure and judgement?". The answers in both questionnaires were again positive. Logistic regression showed that there is no significant effect neither between the watching eyes and the "Win/ Lose" nor between the warning phrase and "Win/ Lose". Therefore, this thesis cannot conclude that the manipulation of social image and social pressure together with potential judgement can have a positive effect on honest online behavior.

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<sup>2</sup>The output table of the logistic regression shows the that the participants who were in a warning overall statistics condition were 0.785 times less likely to win (negative b coefficient). For ease of interpretation, we calculated the odds of those who were not in a warning overall statistics condition over those who were in a warning overall statistics condition using  $1/0.785 = 1.27$

Another opinion question that the second and fourth questionnaires included is "Please rank how uncomfortable the photo of watching eyes made you feel" and the possible answers were: "Not uncomfortable at all", "A bit uncomfortable" and "Very uncomfortable". Most of the participants claimed that they felt a bit uncomfortable or very uncomfortable which could be an indicator for the importance of supervision on honest online behavior.

The third and fourth questionnaires asked the participants to "Please rank how uncomfortable the fact that the overall statistics will be presented to all participants made you feel." and the possible answers were the same as in the previous ranking question. In this question the participant's answers were divided almost equally with again having slightly more people feeling uncomfortable. This suggests that the manipulation of social image and pressure and the potential social judgement can lead to people answering more honestly online. However, it should be mentioned that the picture of watching eyes had a stronger impact than the warning based on the opinion questions' answers. Therefore, it can be concluded that, from this experiment, supervision influences more effectively the behavior of people than potential social exposure and judgement.

Finally, it is worth mentioning that some of the demographic characteristics improved the regression model and can affect significantly the probability of winning or losing in the experiment. From the Table 5.17 we can see that the younger groups of participants are more likely to cheat and eventually win. For example, participants from *Age (18-20)* were significantly more likely than participants aged between 31-40 to win ( $\text{Exp}(B)=0.336$ ,  $p=0.0004$ ). Furthermore, females are more likely to win than males. However, there is not a strong enough relationship between *Gender* and *Win/ Lose*, once the other variables were controlled for. Logistic regression has also shown that participants without any higher education (high school graduated) were significantly more likely to win than those with a PHD. The same is true for the people that chose not to answer this question; they were 2 times more likely to win than those without any University degree.

### 6.2 Limitations & Future Work

Some limitations of this thesis are presented together with suggestion for future work. This part will include some of the difficulties or restrictions that the researcher has faced and some ideas on those could be overcome in future research. General ideas on the topic are stated while the aim of this chapter is to inspire researchers to work on further on this topic.

The ultimate and starting goal for this thesis was to conduct a research online and offline. Addressing online questionnaires to people and at the same time performing offline experiments with volunteers in the university's lab. Under the restrictions of the thesis procedure and the given time frame there was not enough time to conduct the research offline or preferably both online and offline. If conducting the research only online can be considered as a limitation for this thesis, one suggestion for future researchers would be to conduct a similar research which would include offline elements.

The way the research was structured needed four questionnaires and around 200 respondents per questionnaire. Therefore, the collection of a total of 843 was challenging. It is known that the highest the number of respondents is, the more accurate the results will be. Therefore, even though 200 respondents per questionnaire can be considered as enough, it would be preferred to collect more responses. As a result this can be characterized as a limitation of this research and a suggestion would be to try to perform the same research with more people and test whether the same results are found.

In the third and fourth questionnaire, the factors "social exposure" and "potential judgement" are introduced. For them to be tested, the researcher informed the participants that the overall statistics of the experiment will be available by all participants and some opinion questions were added. Naturally, it would be beneficial for further researchers to test these factors offline. For instance, to perform the same experiment but in offline groups so as to check the change in their behavior directly and be more precise about their effects.

The last limitation that can be mentioned for this thesis is the fact that there was no financial support. Since this thesis was carried out by a master student, it would be very hard to

perform an expensive experiment. It is believed that it would help if the experiment included a materialistic price for the participants. This would serve as a higher incentive to cheat. However, as it was stated before, the thesis tried to manipulate this characteristic differently by creating a psychological price for the participants. This could be another point that future researchers could step in and cover by investigating the same or a similar experiment but with the addition of a materialistic price and then comparing the results.

The limitations presented are hoped to serve as incentives for future research. Having in mind the limitations together with the analysis of the results which was provided earlier; this thesis can proceed in answering the sub-questions and the main research question in the following chapter, [7](#).



## 7 Conclusion

In this thesis, the online behavior of people was examined based on different aspects, e.g. anonymity, social presence and supervision, in order to test if there is anything that can manipulate the online behavior of people. After the desk research on the related topics which is presented in chapter 3, an experiment was conducted in order to test the hypothesised relationships. In this chapter, conclusions will be drawn based on the results presented previously and the discussion of the outcomes which will lead to answering the research questions.

The structure of the research includes the creation of four questionnaires. The first one serves as the control group and is simple. The second one includes a picture of watching eyes, the third one includes the warning phrase about the availability of the results to all participants. Last, the fourth one includes both the picture and the warning.

Four sub-research questions were formed to work as a leading way to answering the main research question. The structure of this chapter is as follows: each sub-question will be stated, answered and last the main research question of the thesis will be stated and answered.

### 7.1 Answers to the four research sub-questions

In this section the four sub-questions will be answered in order to form the base for answering the main research question. The first sub-research question and its answer is the following:

(i) *To what extent does the suggestion of supervision (e.g. a pair of eyes) influence honesty online?*

To answer this sub-research question, it is beneficial to keep in mind the literature review that was conducted on the topic of supervision, the general results from all the questionnaires and the performed regression analysis. Of great importance in answering this question are the questionnaire two and four as those were the ones which included the photo of watching eyes that serves as the suggestion of supervision.

Based on the Bernoulli theorem, the expected probability of winning (getting 7+ "Heads")

is around 17%. By comparing this result to the results of the first questionnaire which had 47% observed winning rate, it can be concluded that a large percentage of people has cheated. Here the comparison of the expected winning percentage (Bernoulli) and the observed winning percentage is considered ( $17\% < 47\%$ ). Further, by comparing the expected winning percentage with the observed winning percentage of the second questionnaire (42%) which included the picture of watching eyes, it is seen that again that people had cheated in this case as well. If the comparison is done between the first (control group) and second (experimental group),  $47\% > 42\%$ , it is observed that people in the second questionnaire there was less cheating than in the first one.

The mentioned observations would lead the reader to believe that the picture of watching eyes had an effect on the behavior of people. However, in order to test the results of the questionnaires and the significant influence of the factors, a binary regression analysis was performed. This analysis showed that the factor "watching eyes" does not have a significant effect in this case.

The fact that the majority of the participants believe that people would be more honest in the experiment if someone was supervising them, can lead to the conclusion that people believe that if they are exposed to supervision they would not cheat. The results of the regression show that they were not influenced enough by the picture of "watching eyes". In other words, participants did not consider the picture as "supervision".

An addition that should be stated is the reference to the research of Bateson, Nettle, and Roberts 2006. The picture of "watching eyes" that was used in this experiment was one of the pictures used in Bateson, Nettle, and Roberts 2006's experiment. In the mentioned experiment, the picture of watching eyes was proven to be powerful to change the behavior of people. In contrast with the results of this research which show that the picture was not powerful enough to change people's behavior and was not capable to be considered as "supervision".

The general answer to this sub-research question is that the picture of "watching eyes" does not influence cheating. Therefore, the research concludes that the suggestion of supervision does not have a significant effect on honesty online.

(ii) *How does social pressure (e.g. results) influence the honesty of people online?*

For this sub-research question, the general results from all the questionnaires are again important and having information about the topics of social image and social judgement are necessary. The logistic regression analysis helps in answering this question as well. This sub-research question considers, mainly, the results of the third and fourth questionnaire. In those questionnaires, the mentioned characteristics are tested, with the use of a warning phrase which informs participants of the fact that the overall statistics of the questionnaires will be available to all the participants.

From the desk research, it was found that people value their social image and they act in ways that are socially accepted in order to maintain a "good social image". Also, the social judgement is something that people wish to avoid so they act in line with the general "right thing to do". In this experiment, the aim was to find out more proofs that this opinion holds.

Participants were asked whether they believe that people would be more honest if they were facing potential social exposure and judgement. The majority of respondents answered positively in this question in both the third and the fourth questionnaires. The second question asked participants about how uncomfortable they felt with knowing that the results will be available to all. Again, the majority of people said that they felt either a bit uncomfortable or very uncomfortable.

Those answers would lead in believing that the availability of the results to all participants would be able to influence the cheating behavior of people. However, the results of the logistic regression analysis proves that this factor does not have a significant effect on the cheating behavior of people. Therefore, based on these results, social pressure does not have a significant effect on honest behavior.

(iii) *To what extent are individuals comfortable with stating their name while being online?*

From the research done before the experiment was performed, it was indicated that people would prefer to keep their anonymity while surfing the internet. Sometimes, however, they believed they were anonymous but in reality they could be traced and tracked down. In any case, they felt more comfortable thinking that they are not "known" when they are online. This was one

of the things that the experiment aimed to clarify.

In the experiment people had the opportunity of staying anonymous, stating a nickname of their preference or stating their name. In all four questionnaires, the majority of the participants chose to stay anonymous. The difference between anonymity and the other options was large enough to leads to the conclusion that people are more comfortable staying anonymous when being online. The percentage of winning in the group which kept their anonymity in all four questionnaires is very high which also indicates that some of the people who stayed anonymous also cheated. The idea of being anonymous is connected with the idea of freely doing what anything and not getting caught. From the results, it is found that people are not comfortable with stating they name while being online if they have the choice of staying anonymous.

Further, the logistic regression analysis showed that anonymity has a significant effect on *Win/Lose*, people who were anonymous tend to cheat more. Therefore, being anonymous was proven to influence the honesty in an online environment, in other words, if someone is anonymous he is more likely to engage in a dishonest act.

(iv) *How does "being physically alone" while performing a task influence the honesty of people?*

For this sub-research question to be answered, desk research from previous chapters will be extracted and answers from all the questionnaires will be used as the question *"Are you alone while performing this task?"* is asked in all four questionnaires and it is believed it can make a difference in the answers received.

From the previous researches, it is expected from people to act more honestly when they are with someone else rather than when being alone. This is because people based their self-perception on their own impression but also on what others think of them. In this experiment, it was shown that people who were alone tend to have higher *"winning percentages"* in contrast with people who stated that they were not alone while they were performing flipping the coin. This outcome holds in all four questionnaires, however, the percentages vary based on the fact that there were also other variables manipulating the *"Win/ Lose"* each time.

Based on the results collected from each questionnaire and the statistical analysis that has been

performed to prove the significant relationship between the variables, it can be concluded that the factor "Alone", influences cheating in the experiment. The logistic regression analysis has proven that the factor "alone" has a significant effect on cheating. Therefore, it can be concluded that the physical presence of others can influence the honest behavior of people online. In other words, if people are not alone tend to engage in a dishonest behavior less than if they would be alone.

### 7.2 Answer to the main research question

The main research question and its answer is the following:

*"To what extent does the perceived anonymity influence the (dis)honest behavior of people when asked to claim something online, while other characteristics, such as the physical presence of others or the suggestion of supervision are changed?"*

The main research question of this thesis was inspired by the challenges that the government and in general companies or people face while asking others to claim something online. For instance, the government asks people to claim their taxes online in order to pay an extra amount of money or to get tax returns. It is a fact that people tend to lie in this kind of operations and there is the need to, firstly, understand what causes people to lie, and secondly what is there to be done in order to minimize this kind of behaviors.

This thesis addressed as one of the most important factors, the *Anonymity* of people while being online. Desk research suggested that even though people who surf the internet cannot be completely anonymous, they tend to think that they can be and therefore, avoid the consequences of their actions. Another factor that was included in the research and was proven to influence honesty online is the physical presence of others. Besides being alone or not, this thesis addresses other factors that could influence people's honest behavior online and those are: whether people are being supervised or not, whether they face potential social judgement. After conducting the research and performing the experiment, the last two were proven not to be significant to change the outcome of *Win/ Lose*. Therefore, those factors are not significant to change the dishonest behavior of people.

Given that in this experiment the mentioned factors are being manipulated, this thesis concludes in the following. Firstly, people prefer to stay anonymous while performing a task online. In each questionnaire people were asked if they want to remain anonymous or state their name or their nickname and the majority of them answered that they want to remain anonymous. Secondly, people felt a bit less uncomfortable by stating their nickname rather than stating their name even though stating a nickname was still considered as not being anonymous anymore. Thirdly and most importantly, the experiment has showed that people who stated their name tend to win less than people who were anonymous. The overall analysis of the results showed that anonymity can be considered as a significant factor that can change the behavior of people from cheating towards being more honest.

Important to mention is that in each questionnaire, the other factors that were considered to also influence the honest behavior of people in an online environment are being manipulated. As a result, the percentages differ in each questionnaire because honest behavior is influenced by more factors and not only anonymity. Therefore, the thesis concludes that the difference in winning or losing are explained by a combination of characteristics but most importantly by being alone or not and by being anonymous or not.

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# Appendix

## First Questionnaire



Welcome to the "Online-Game" survey!

This survey is part of a research project for the University of Twente.



The survey will only take around 5-7 mins and will include a task and some questions that you will be asked to give your opinion.

Your participation is much appreciated and is much needed for our research. We appreciate the time you spent on it.



Following there are some things you need to know before answering.

- ✓ Your participation to this study is voluntary
- ✓ You may choose not to participate and you can withdraw at any given moment, there are no consequences for doing so
- ✓ The results of the study will be used for research purposes and may be shared with the University of Twente.





By clicking the "I agree" button below you agree to participate in the survey by stating that:

- ✓ You have read and understood the above information,
- ✓ You voluntarily agree to participate and
- ✓ You are at least 18+ years old.

- ☐ I agree
- ☐ I disagree



Would you like to state your name/ a nickname or would you like to keep your anonymity?

- ☐ I would like to state my name.
- ☐ I would like to state a nickname.
- ☐ I would like to keep my anonymity.




Are you alone in the room while answering this questionnaire?

- ☐ Yes, I am alone.
- ☐ No, there is at least one person around me.



You are kindly asked to read the following instructions:

- Please take a coin, paper and pen
- Then, please flip a coin 10 times on the ground or on a table
- Please note your findings
- And then, report the findings in the following gaps



Every time that the coin lands on "Heads", you will collect 1 point.

🔔 Winners are considered the players who managed to get 7 or more "Heads". 🔔

Heads	0
Tails	0
Total	0



You have successfully completed the first part of the survey.

The second and final part of the survey includes some standard demographic questions.




What gender do you identify as?

- ☐ Male
- ☐ Female
- ☐ Other,
- ☐ Prefer not to answer.

What is your age?

- ☐ 0-10 years old
- ☐ 11-20 years old
- ☐ 21-30 years old
- ☐ 31-40 years old
- ☐ 41-50 years old
- ☐ 51+ years old



Where are you coming from?

☐ Europe

☐ America

☐ Africa

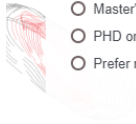
☐ Australia

☐ Asia

☐ Other,

What is the highest degree or level of education you have completed?

- ☐ High School
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ PHD or higher
- ☐ Prefer not to answer.



The questionnaire has now ended. Your participation is much appreciated.

The questionnaire serves as a part of a study. The aim this study is to examine the reporting behavior of people when asked to claim something online.

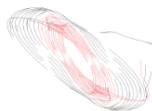
The results are anonymous. Under no circumstances you are to face any consequences for participating despite your answers.

If you wish to see the overall statistics of the questionnaire, please state your email address in the following gap and you will receive an email from the researcher.

Hope you enjoyed answering the questionnaire and thank you once again for the participation.



We thank you for your time spent taking this survey.  
Your response has been recorded.



## Second Questionnaire

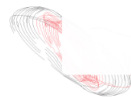


Welcome to the "Online-Game" survey!

This survey is part of a research project for the University of Twente.

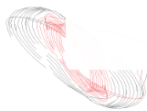
The survey will only take around 5-7 mins and will include a task and some questions that you will be asked to give your opinion.

Your participation is much appreciated and is much needed for our research. We appreciate the time you spent on it.



Following there are some things you need to know before answering.

- ✓ Your participation to this study is voluntary
- ✓ You may choose not to participate and you can withdraw at any given moment, there are no consequences for doing so
- ✓ The results of the study will be used for research purposes and may be shared with the University of Twente.





By clicking the "I agree" button below you agree to participate in the survey by stating that:

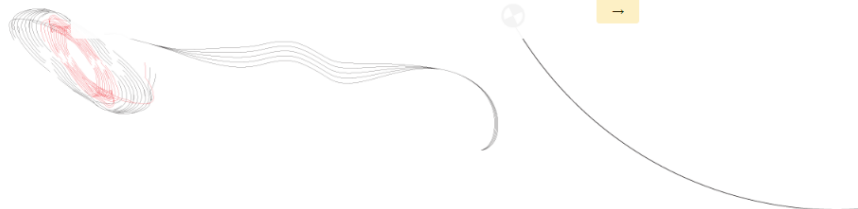
- ✓ You have read and understood the above information,
- ✓ You voluntarily agree to participate and
- ✓ You are at least 18+ years old.

- ☐ I agree
- ☐ I disagree



Would you like to state your name/ a nickname or would you like to keep your anonymity?

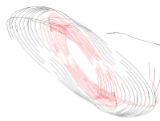
- ☐ I would like to state my name,
- ☐ I would like to state a nickname,
- ☐ I would like to keep my anonymity.





Are you alone in the room while answering this questionnaire?

- ☐ Yes, I am alone.
- ☐ No, there is at least one person around me.

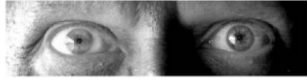


*You are kindly asked to read the following instructions:*

- Please take a coin, paper and pen
- Then, please flip a coin 10 times on the ground or on a table
- Please note your findings
- And then, report the findings in the following gaps







Every time that the coin lands on "Heads", you will collect 1 point.

Winners are considered the players who managed to get 7 or more "Heads".

Heads	0
Tails	0
Total	0

→



Please rank how uncomfortable the picture of watching eyes made you feel.

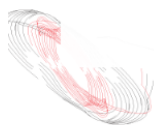
	Not uncomfortable at all.	A bit uncomfortable.	Very uncomfortable.
Picture of watching eyes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

→



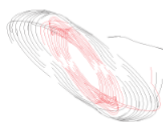
Do you think that people would be more honest in the experiment if someone was supervising them?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not



You have successfully completed the first part of the survey.

The second and final part of the survey includes some standard demographic questions.



What gender do you identify as?

- ☐ Male
- ☐ Female
- ☐ Other,
- ☐ Prefer not to answer.

What is your age?

- ☐ 0-10 years old
- ☐ 11-20 years old
- ☐ 21-30 years old
- ☐ 31-40 years old
- ☐ 41-50 years old
- ☐ 51+ years old

Where do you come from?

- ☐ Europe
- ☐ America
- ☐ Africa
- ☐ Australia
- ☐ Asia
- ☐ Other,

What is the highest degree or level of education you have completed?

- ☐ High school
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ PHD or higher
- ☐ Prefer not to answer.



The questionnaire has now ended. Your participation is much appreciated.

The questionnaire serves as a part of a study. The aim this study is to examine the reporting behavior of people when asked to claim something online.

The results are anonymous. Under no circumstances you are to face any consequences for participating despite your answers.

If you wish to see the overall statistics of the questionnaire, please state your email address in the following gap and you will receive an email from the researcher.

Hope you enjoyed answering the questionnaire and thank you once again for the participation.



We thank you for your time spent taking this survey.  
Your response has been recorded.

### Third Questionnaire



Welcome to the "Online-Game" survey!

This survey is part of a research project for the University of Twente.

The survey will only take around 5-7 mins and will include a task and some questions that you will be asked to give your opinion.

Your participation is much appreciated and is much needed for our research. We appreciate the time you spent on it.



Following there are some things you need to know before answering.



- ✓ Your participation to this study is voluntary
- ✓ You may choose not to participate and you can withdraw at any given moment, there are no consequences for doing so
- ✓ The results of the study will be used for research purposes and may be shared with the University of Twente.





By clicking the "I agree" button below you agree to participate in the survey by stating that:

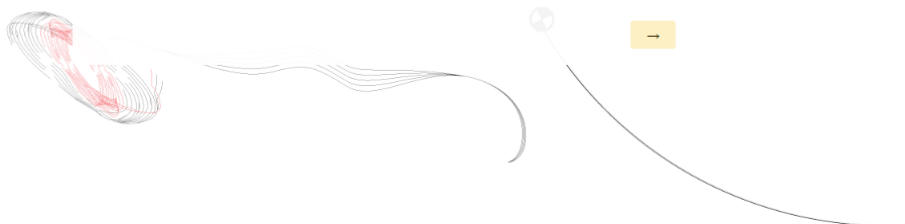
- ✓ You have read and understood the above information,
- ✓ You voluntarily agree to participate and
- ✓ You are at least 18+ years old.

- ☐  I agree
- ☐  I disagree



Would you like to state your name/ a nickname or would you like to remain anonymous? If you choose to continue with your name or nickname, please write it in the gap.

- ☐ I would like to state my name,
- ☐ I would like to state a nickname,
- ☐ I would like to stay anonymous.

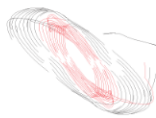




UNIVERSITY OF TWENTE

Are you alone in the room while answering this questionnaire?

- ☐ Yes, I am alone.
- ☐ No, there is at least one person around me.



UNIVERSITY OF TWENTE

You are kindly asked to read the following instructions:

- Please take a coin, paper and pen
- Then, please flip a coin 10 times on the ground or on a table
- Please note your findings
- And then, report the findings in the following gaps

Every time that the coin lands on "Heads", you will collect 1 point.

🏆 Winners are considered the players who managed to get 7 or more "Heads" 🏆

Note: Keep in mind that the overall statistics of the answers of all participants will be presented to all the respondents.

Heads

Tails

Total

0

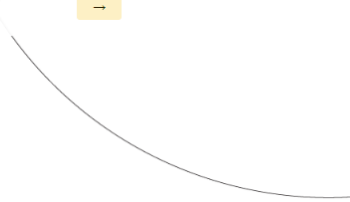
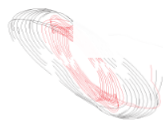
0

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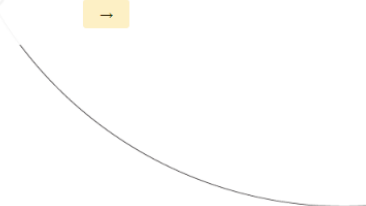
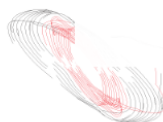
Please rank how uncomfortable the fact that the results will be presented to all participants made you feel.

	Not uncomfortable at all.	A bit uncomfortable.	Very uncomfortable.
Results will be presented to all participants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Do you think that people would be more honest in the experiment if they would be facing potential social exposure and judgement?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

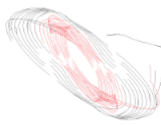






You have successfully completed the first part of the survey.

The second and final part of the survey includes some standard demographic questions.



What do you identify as?

- ☐ Male
- ☐ Female
- ☐ Other,
- ☐ Prefer not to answer.

What is your age?

- ☐ 0-10 years old
- ☐ 11-20 years old
- ☐ 21-30 years old
- ☐ 31-40 years old
- ☐ 41-50 years old
- ☐ 51+ years old



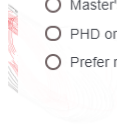
Where do you come from?

- ☐ Europe
- ☐ America
- ☐ Africa
- ☐ Australia
- ☐ Asia
- ☐ Other,
- ☐ Prefer not to answer.



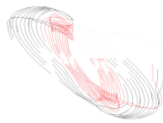
What is the highest degree or level of education you have completed?

- ☐ High school
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ PHD or higher
- ☐ Prefer not to answer.



If you would like to know the overall statistics of this survey, please state your email below.

- ☐ I would like to know them.
- ☐ I wouldn't like to know them.



The questionnaire has now ended. Your participation is much appreciated.

The questionnaire serves as a part of a study. The aim this study is to examine the reporting behavior of people when asked to claim something online.

The results are anonymous. Under no circumstances you are to face any consequences for participating despite your answers.

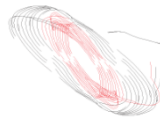
If you wish to see the overall statistics of the questionnaire, please state your email address in the following gap and you will receive an email from the researcher.

Hope you enjoyed answering the questionnaire and thank you once again for the participation.





We thank you for your time spent taking this survey.  
Your response has been recorded.



## Fourth Questionnaire



Welcome to the "Online-Game" survey!

This survey is part of a research project for the University of Twente.

The survey will only take around 5-7 mins and will include a task and some questions that you will be asked to give your opinion.

Your participation is much appreciated and is much needed for our research. We appreciate the time you spent on it.





Following there are some things you need to know before answering.

- ✓ Your participation to this study is voluntary
- ✓ You may choose not to participate and you can withdraw at any given moment, there are no consequences for doing so
- ✓ The results of the study will be used for research purposes and may be shared with the University of Twente.



By clicking the "I agree" button below you agree to participate in the survey by stating that:

- ✓ You have read and understood the above information,
- ✓ You voluntarily agree to participate and
- ✓ You are at least 18+ years old.

- ☐ I agree
- ☐ I disagree





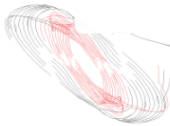
Would you like to state your name/ a nickname or would you like to remain anonymous? If you choose to continue with your name or nickname, please write it in the gap.

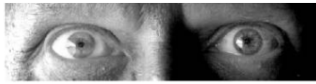
- ☐ I would like to state my name,
- ☐ I would like to state a nickname,
- ☐ I would like to stay anonymous.



Are you alone in the room while answering this questionnaire?

- ☐ Yes, I am alone.
- ☐ No, there is at least one person around me.





You are kindly asked to read the following instructions:

- Please take a coin, paper and pen
- Then, please flip a coin 10 times on the ground or on a table
- Please note your findings
- And then, report the findings in the following gaps



Every time that the coin lands on "Heads", you will collect 1 point.

👤 Winners are considered the players who managed to get 7 or more "Heads" 🏆

Note: Keep in mind that the overall statistics of the answers of all participants will be presented to all the respondents.



Heads

Tails

Total

0

0

0





Please rank how uncomfortable the following made you feel.

	Not uncomfortable at all.	A bit uncomfortable.	Very uncomfortable.
Picture of watching eyes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Results will be presented to all the participants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Do you think that people would be more honest in the experiment if someone was supervising them?

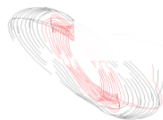
- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not





You have successfully completed the first part of the survey.

The second and final part of the survey includes some standard demographic questions.



What do you identify as?

☐ Male

☐ Female

☐ Other,

☐ Prefer not to answer.

What is your age?

☐ 0-10 years old

☐ 11-20 years old

☐ 21-30 years old

☐ 31-40 years old

☐ 41-50 years old

☐ 51+ years old



Where do you come from?

☐ Europe

☐ America

☐ Africa

☐ Australia

☐ Asia

☐ Other,



What is the highest degree or level of education you have completed?

- ☐ High school
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ PHD or higher
- ☐ Other,

- ☐ Prefer not to answer.



The questionnaire has now ended. Your participation is much appreciated.

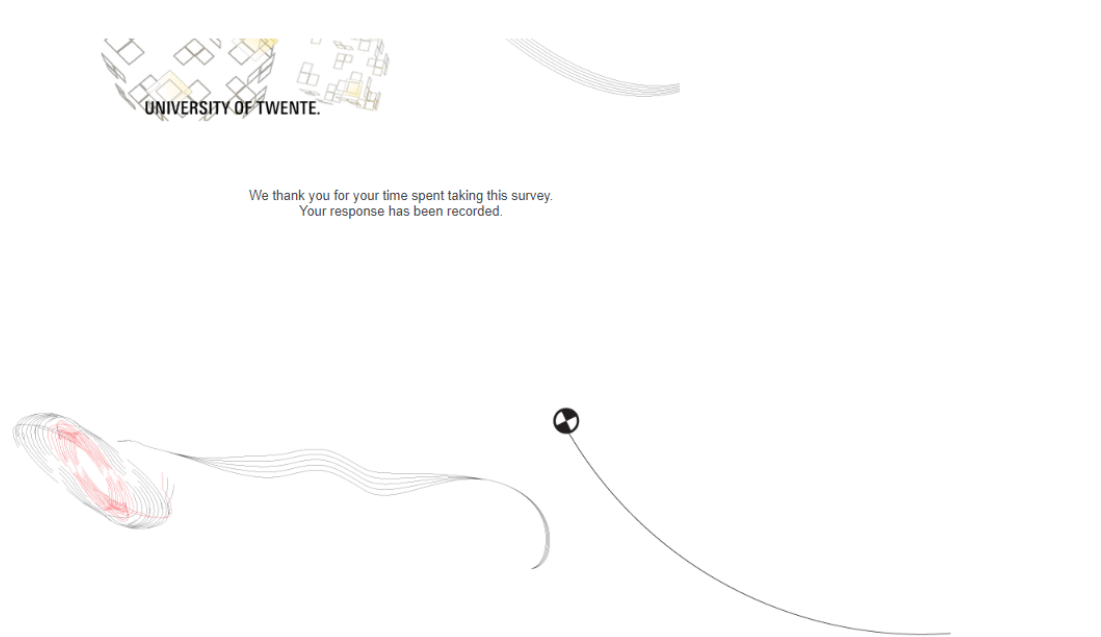
The questionnaire serves as a part of a study. The aim this study is to examine the reporting behavior of people when asked to claim something online.

The results are anonymous. Under no circumstances you are to face any consequences for participating despite your answers.

If you wish to see the overall statistics of the questionnaire, please state your email address in the following gap and you will receive an email from the researcher.

Hope you enjoyed answering the questionnaire and thank you once again for the participation.





## Results first Questionnaire

A combination of the above results was performed. In the following figure, figure [A.1](#), the 68.3% that kept their anonymity is analyzed based on the factor "Alone or not" and if they won or not. It can be seen that in total 71.4% of those who kept their anonymity were also alone while performing the task while 28.57% were with at least one other person in the room. Out of the 71.4% that were anonymous and alone, 42.14% won and 29.29% lost. Out of the 28.57%, 11.43% won and 17.14% lost.

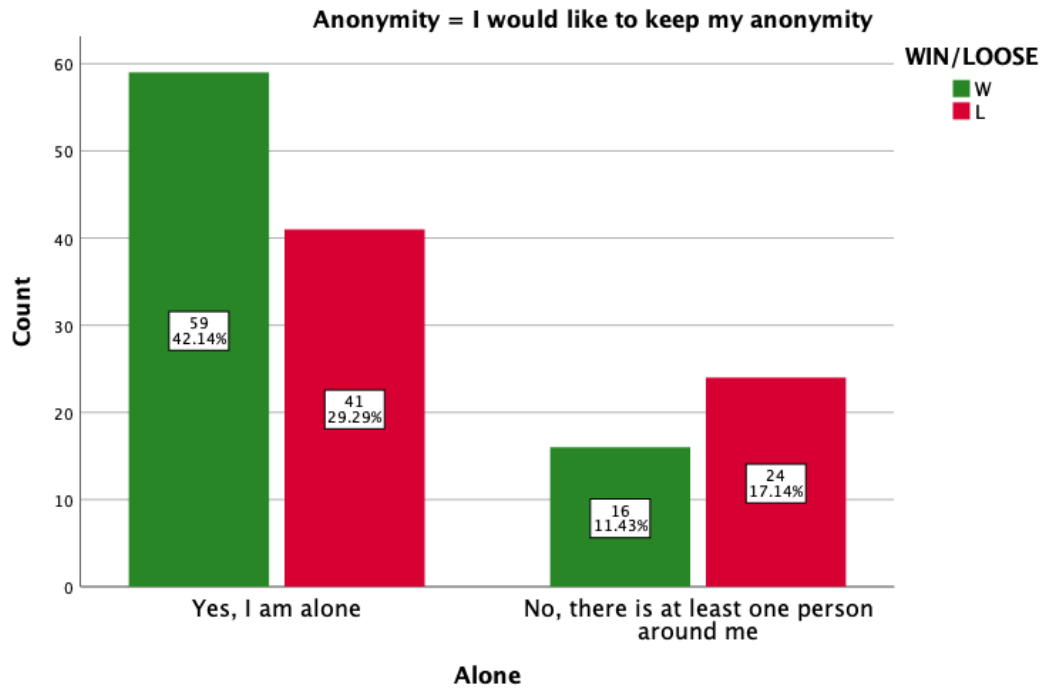


Figure A.1: People who kept their anonymity - Were they Alone or not? - Did they Win or Lose ?

Similarly, in the graph below, figure [A.2](#), there is the other category of the 21.96% of the total amount of participants who chose to state a nickname. Within this group, 66.67% were alone from which 31.11% won and 35.56% lost. 33.33% were with at least one other person, from which 13.33% won and 20% lost.

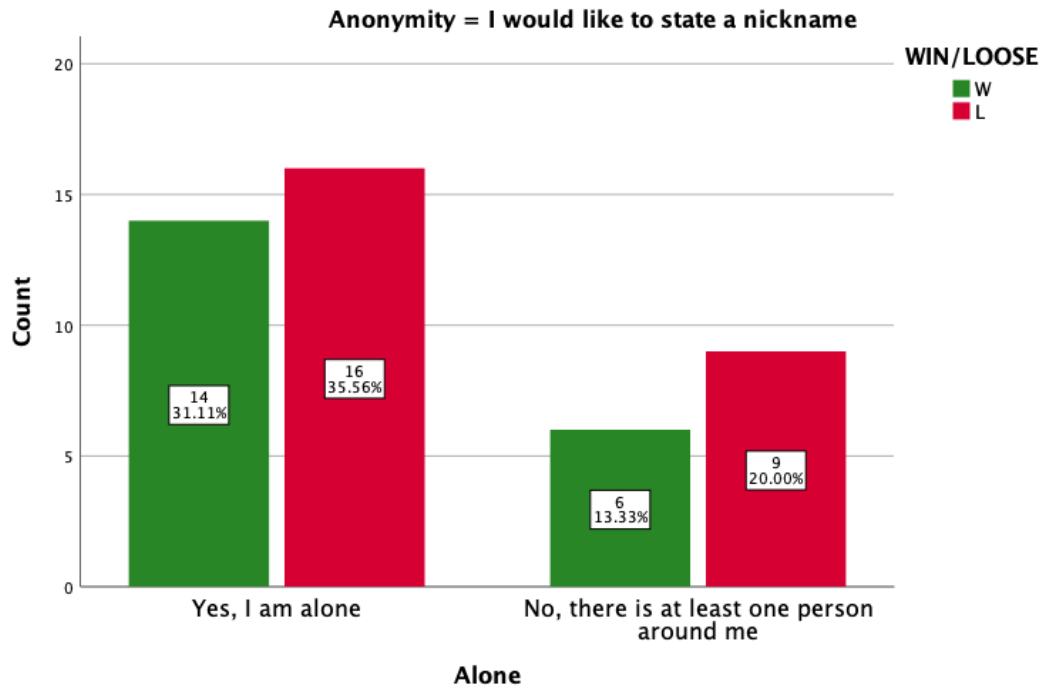


Figure A.2: People who stated a nickname - Were they Alone or not? - Did they Win or Lose ?

In the figure [A.15](#), the third category is presented. This category includes the people who chose to state their name which is the 9.76% of all participants. From the people who stated their name; 50% was alone; from which 10% has won and 40% lost. From the people who stated their name 50% were with at least another person and all of them have lost.

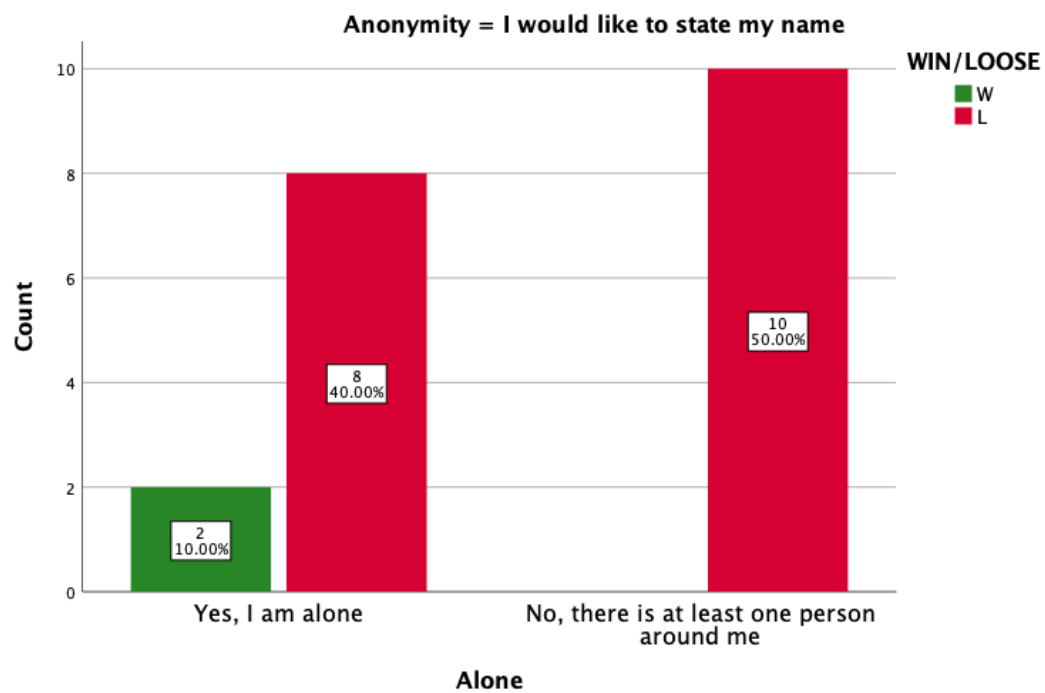


Figure A.3: People who stated their name - Were they Alone or not? - Did they Win or Lose ?

The statistical table which includes the detailed percentages for the above graphs is presented below.

Alone * WIN/LOOSE * Anonymity Crosstabulation						
Anonymity				WIN_LOOSE		Total
				L	W	
I would like to keep my anonymity	Alone	Yes, I am alone	Count	41	59	100
			% within Alone	41.0%	59.0%	100.0%
			% within WIN_LOOSE	63.1%	78.7%	71.4%
			% of Total	29.3%	42.1%	71.4%
		No, there is at least one person around me	Count	24	16	40
			% within Alone	60.0%	40.0%	100.0%
			% within WIN_LOOSE	36.9%	21.3%	28.6%
			% of Total	17.1%	11.4%	28.6%
	Total			Count	65	75
				% within Alone	46.4%	53.6%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	46.4%	53.6%
I would like to state a nickname	Alone	Yes, I am alone	Count	16	14	30
			% within Alone	53.3%	46.7%	100.0%
			% within WIN_LOOSE	64.0%	70.0%	66.7%
			% of Total	35.6%	31.1%	66.7%
		No, there is at least one person around me	Count	9	6	15
			% within Alone	60.0%	40.0%	100.0%
			% within WIN_LOOSE	36.0%	30.0%	33.3%
			% of Total	20.0%	13.3%	33.3%
	Total			Count	25	20
				% within Alone	55.6%	44.4%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	55.6%	44.4%
I would like to state my name	Alone	Yes, I am alone	Count	8	2	10
			% within Alone	80.0%	20.0%	100.0%
			% within WIN_LOOSE	44.4%	100.0%	50.0%
			% of Total	40.0%	10.0%	50.0%
		No, there is at least one person around me	Count	10	0	10
			% within Alone	100.0%	0.0%	100.0%
			% within WIN_LOOSE	55.6%	0.0%	50.0%
			% of Total	50.0%	0.0%	50.0%
	Total			Count	18	2
				% within Alone	90.0%	10.0%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	90.0%	10.0%
Total	Alone	Yes, I am alone	Count	65	75	140
			% within Alone	46.4%	53.6%	100.0%
			% within WIN_LOOSE	60.2%	77.3%	68.3%
			% of Total	31.7%	36.6%	68.3%
		No, there is at least one person around me	Count	43	22	65
			% within Alone	66.2%	33.8%	100.0%
			% within WIN_LOOSE	39.8%	22.7%	31.7%
			% of Total	21.0%	10.7%	31.7%
	Total			Count	108	97
				% within Alone	52.7%	47.3%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	52.7%	47.3%

Figure A.4: Table Alone/ WL/ Anonymity

## Results second Questionnaire

For more interesting results, a combination of the above results was performed. In the following

figure, figure A.5, the percentage of the people who kept their anonymity is analyzed based on the factor "Alone or not" and "Win or Lose". It can be seen that in total 80% of those who kept their anonymity and were also alone while performing the task; from which 42.14% won and 37.86% lost. The rest of the people who kept their anonymity (20%) were not alone; 9.29% of those who kept their anonymity and were not alone won while 10.71% lost.

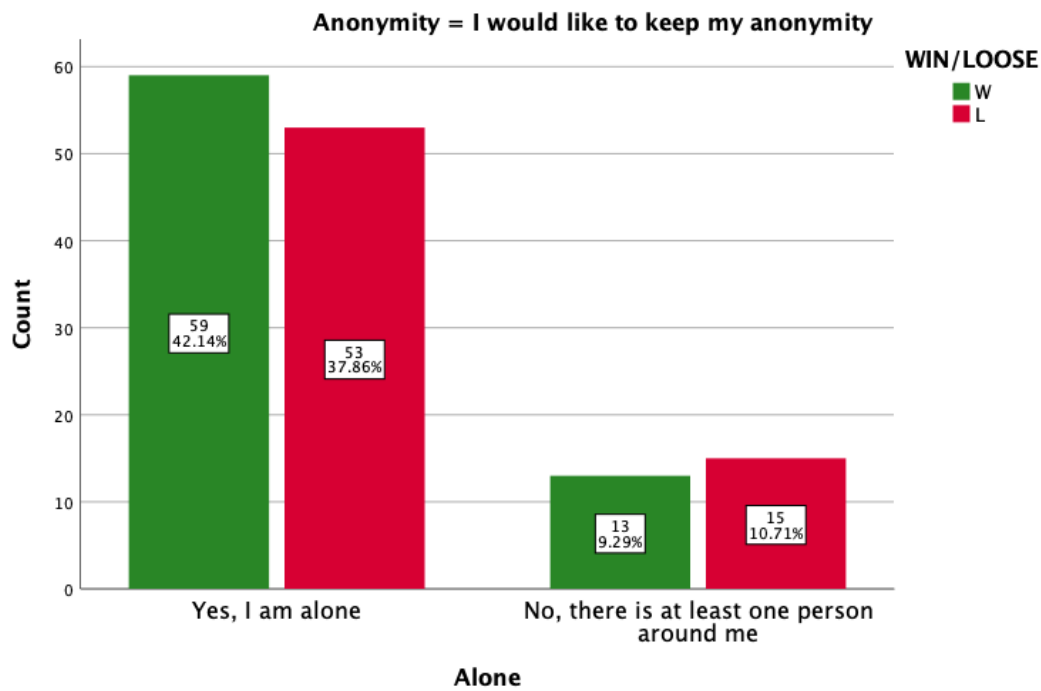


Figure A.5: People who kept their anonymity - Were they Alone or not? - Did they Win or Lose ?

Similarly, in the graph below, figure A.6, there is the other category of the 21.96% of the total amount of participants who chose to state a nickname. Within this group, 20% was alone and won and 20% were alone and lost. 10% were with at least one other person in the room and won while 50% were not alone and lost. The third category is presented, this includes the people who chose to state their name which is the 9.76% of all participants. In this group everybody lost.

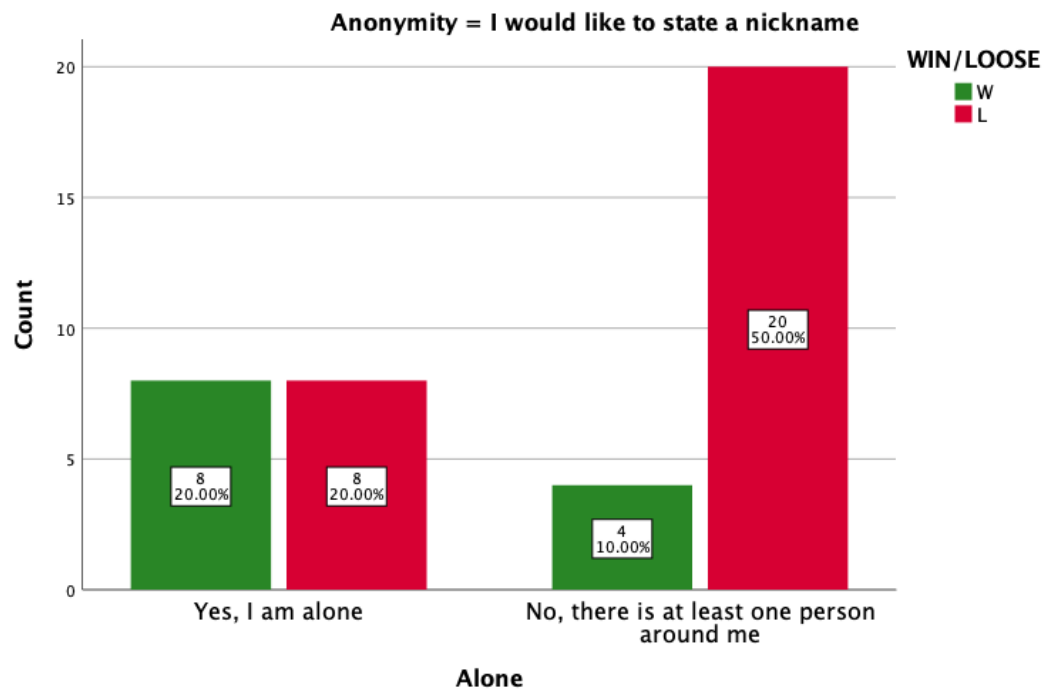


Figure A.6: People who stated a nickname - Were they Alone or not? - Did they Win or Lose ?

The statistical table which includes the detailed percentages for the above graphs is presented below.



Alone * WIN/LOOSE * Anonymity Crosstabulation						
Anonymity				WIN_LOOSE		Total
				L	W	
I would like to keep my anonymity	Alone	Yes, I am alone	Count	53	59	112
			% within Alone	47.3%	52.7%	100.0%
			% within WIN_LOOSE	77.9%	81.9%	80.0%
			% of Total	37.9%	42.1%	80.0%
		No, there is at least one person around me	Count	15	13	28
			% within Alone	53.6%	46.4%	100.0%
			% within WIN_LOOSE	22.1%	18.1%	20.0%
			% of Total	10.7%	9.3%	20.0%
	Total			Count	68	72
				% within Alone	48.6%	51.4%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	48.6%	51.4%
I would like to state a nickname	Alone	Yes, I am alone	Count	8	8	16
			% within Alone	50.0%	50.0%	100.0%
			% within WIN_LOOSE	28.6%	66.7%	40.0%
			% of Total	20.0%	20.0%	40.0%
		No, there is at least one person around me	Count	20	4	24
			% within Alone	83.3%	16.7%	100.0%
			% within WIN_LOOSE	71.4%	33.3%	60.0%
			% of Total	50.0%	10.0%	60.0%
	Total			Count	28	12
				% within Alone	70.0%	30.0%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	70.0%	30.0%
I would like to state my name	Alone	No, there is at least one person around me	Count	20		20
			% within Alone	100.0%		100.0%
			% within WIN_LOOSE	100.0%		100.0%
			% of Total	100.0%		100.0%
	Total			Count	20	20
				% within Alone	100.0%	100.0%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	100.0%	100.0%
Total	Alone	Yes, I am alone	Count	61	67	128
			% within Alone	47.7%	52.3%	100.0%
			% within WIN_LOOSE	52.6%	79.8%	64.0%
			% of Total	30.5%	33.5%	64.0%
		No, there is at least one person around me	Count	55	17	72
			% within Alone	76.4%	23.6%	100.0%
			% within WIN_LOOSE	47.4%	20.2%	36.0%
			% of Total	27.5%	8.5%	36.0%
	Total			Count	116	84
				% within Alone	58.0%	42.0%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	58.0%	42.0%

Figure A.7: Table Alone/ WL/ Anonymity

As stated, this questionnaire included the picture of watching eyes. In order to identify the strength of the influence some opinion questions were added. The first one asked the participants' to rank whether people would be more honest in the experiment if someone was supervising them. 21% answered "Definitely yes", 41% "Probably yes", 31.50% "Might or might not", 4%

"Probably not" and 2.5% "Definitely not". The answers are visualized in the following graph, figure A.8.

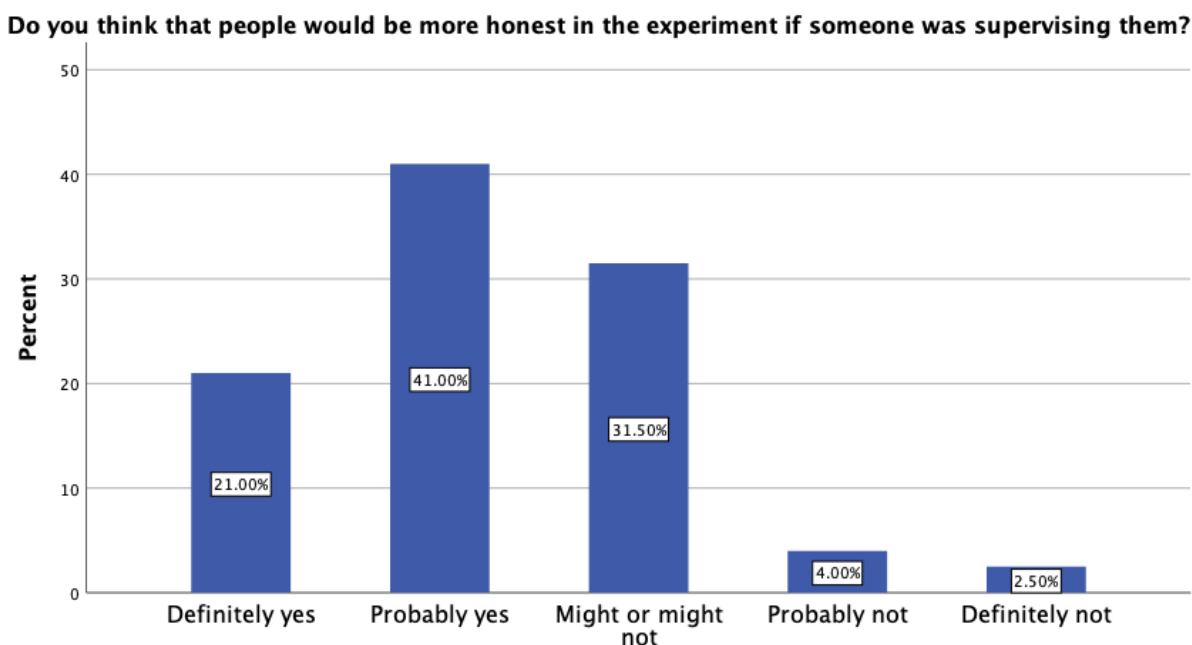


Figure A.8: Do you think that people would be more honest in the experiment if someone was supervising them?

The second question asked the participants to rank how uncomfortable the picture of watching eyes made them feel. 35% answered "Not uncomfortable at all", 29% "A bit uncomfortable" and 36% "Very uncomfortable".

### Results third Questionnaire

Similarly with the previous questionnaires, a combination of the above results was performed. In the following figure, figure A.9, the percentage of the people who kept their anonymity is analyzed based on the factor "Alone or not" and "Win or Lose". It can be seen that in total 61.54% of those who kept their anonymity and were also alone while performing the task; 31.95% won while 29.59% lost. 38.46% of those who kept their anonymity and were not alone; 14.20% won and 24.26% lost.

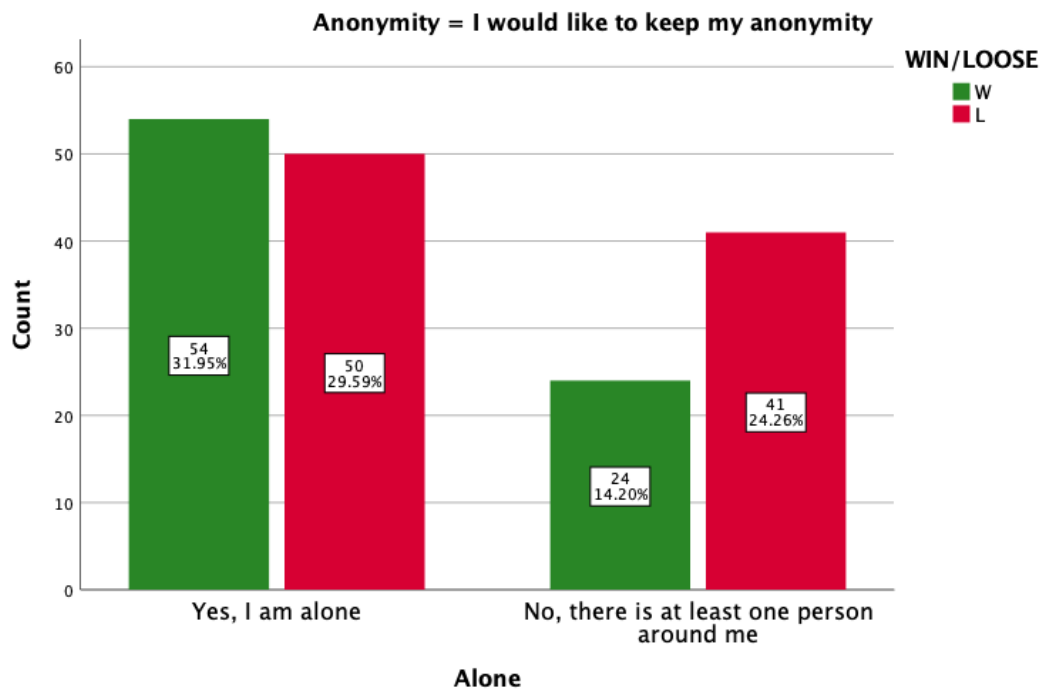


Figure A.9: People who kept their anonymity - Were they Alone or not? - Did they Win or Lose ?

Similarly, in the graph below, figure [A.10](#), there is the category of participants who chose to state a nickname. Within this group 34.38% were alone; from which 28.13% won and 6.25% lost . 65.63% were with at least one other person in the room; from these people, 34.38% won while 31.25% lost. The third category is presented, this includes the people who chose to state their name. The 20 people that stated their name were with at least one other person and all of them lost.

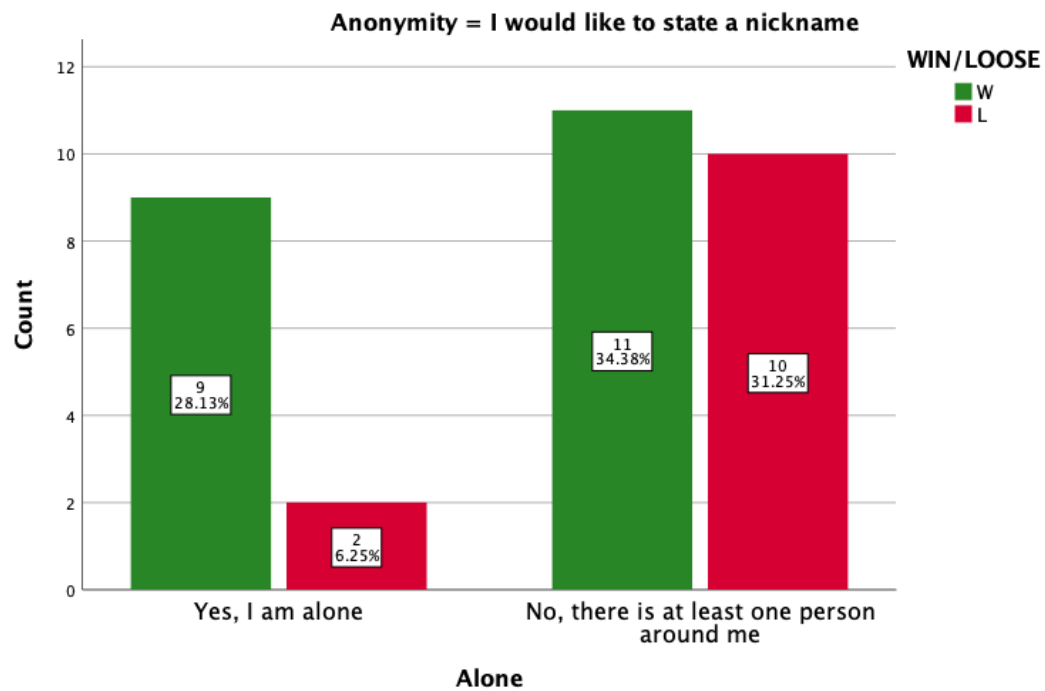


Figure A.10: People who stated a nickname - Were they Alone or not? - Did they Win or Lose ?

The statistical table which includes the detailed percentages for the above graphs is presented below.

Alone * WIN/LOOSE * Anonymity Crosstabulation						
Anonymity				WIN_LOOSE		Total
				L	W	
I would like to keep my anonymity	Alone	Yes, I am alone	Count	50	54	104
			% within Alone	48.1%	51.9%	100.0%
			% within WIN_LOOSE	54.9%	69.2%	61.5%
			% of Total	29.6%	32.0%	61.5%
		No, there is at least one person around me	Count	41	24	65
			% within Alone	63.1%	36.9%	100.0%
			% within WIN_LOOSE	45.1%	30.8%	38.5%
			% of Total	24.3%	14.2%	38.5%
	Total			Count	91	78
				% within Alone	53.8%	46.2%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	53.8%	46.2%
I would like to state a nickname	Alone	Yes, I am alone	Count	2	9	11
			% within Alone	18.2%	81.8%	100.0%
			% within WIN_LOOSE	16.7%	45.0%	34.4%
			% of Total	6.3%	28.1%	34.4%
		No, there is at least one person around me	Count	10	11	21
			% within Alone	47.6%	52.4%	100.0%
			% within WIN_LOOSE	83.3%	55.0%	65.6%
			% of Total	31.3%	34.4%	65.6%
	Total			Count	12	20
				% within Alone	37.5%	62.5%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	37.5%	62.5%
I would like to state my name	Alone	No, there is at least one person around me	Count	20		20
			% within Alone	100.0%		100.0%
			% within WIN_LOOSE	100.0%		100.0%
			% of Total	100.0%		100.0%
	Total			Count	20	20
				% within Alone	100.0%	100.0%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	100.0%	100.0%
Total	Alone	Yes, I am alone	Count	52	63	115
			% within Alone	45.2%	54.8%	100.0%
			% within WIN_LOOSE	42.3%	64.3%	52.0%
			% of Total	23.5%	28.5%	52.0%
		No, there is at least one person around me	Count	71	35	106
			% within Alone	67.0%	33.0%	100.0%
			% within WIN_LOOSE	57.7%	35.7%	48.0%
			% of Total	32.1%	15.8%	48.0%
	Total			Count	123	98
				% within Alone	55.7%	44.3%
				% within WIN_LOOSE	100.0%	100.0%
				% of Total	55.7%	44.3%

Figure A.11: Table Alone/ WL/ Anonymity

In the third questionnaire the introduction of the public exposure and social pressure aims to test whether these factors influence the behavior of people towards the game. In order to identify the strength of the influence some opinion questions were added. The first one asked the participants if they think that people would be more honest in the experiment if they would

be facing potential social exposure and judgement . 30.77% answered "Definitely yes", 32.58% "Probably yes", 24.89% "Might or might not", 5.88% "Probably not" and 5.88% "Definitely not". The answers are visualized in the following graph, figure A.12

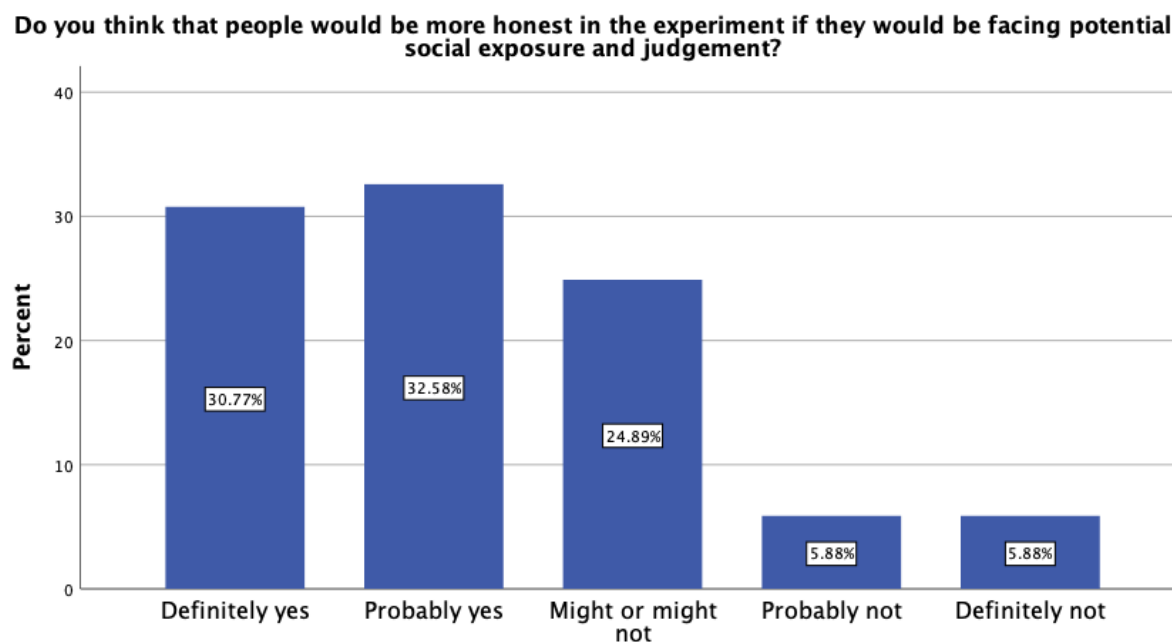


Figure A.12: Do you think that people would be more honest in the experiment if they would be facing potential social exposure and judgement?

The second question asked the participants to rank how uncomfortable the fact that the results would be presented to all participants made them feel. 32.58% answered "Not uncomfortable at all", 38.46% "A bit uncomfortable" and 28.96% "Very uncomfortable".

#### Results fourth Questionnaire

Similarly with the previous questionnaires, a combination of the above results was performed. In the following figure, figure A.13, the percentage that kept their anonymity is analyzed based on the factor "Alone or not" and if they won or not. It can be seen that in total 26.59% of those who kept their anonymity and were also alone while performing the task won while 39.31% lost. 10.40% of those who kept their anonymity and were not alone won and 23.70% that kept their anonymity and were not alone, lost.

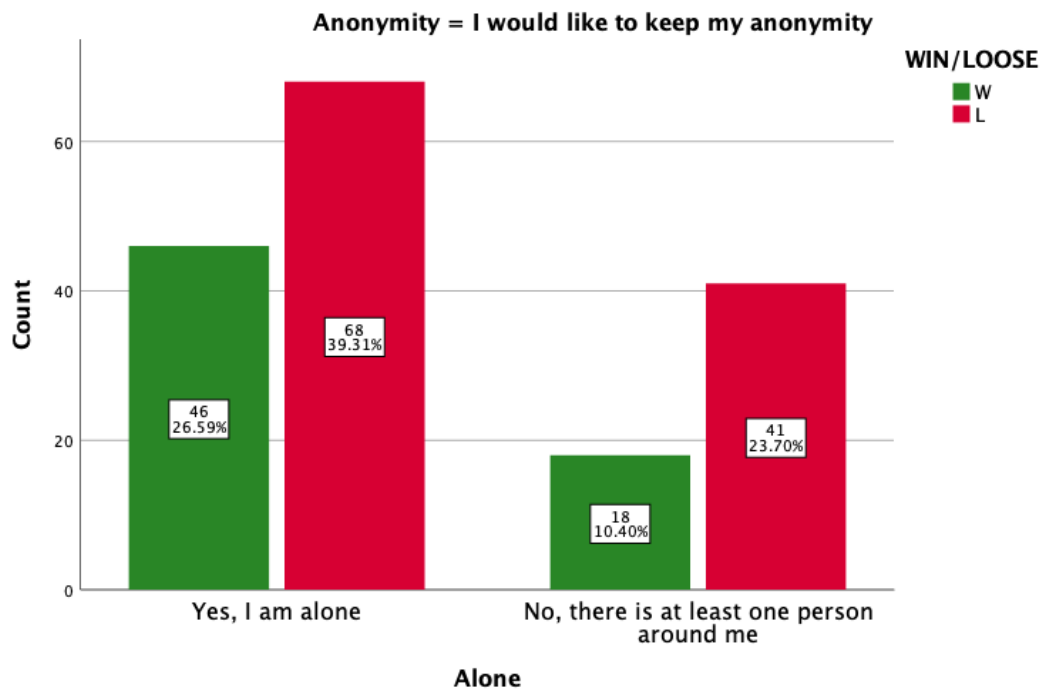


Figure A.13: People who kept their anonymity - Were they Alone or not? - Did they Win or Lose ?

In the following figure [A.10](#), the participants who chose to state a nickname are analyzed based on whether they were "Alone or not" and if they "Won or Lost". 26.47% was alone and won while 5.88% were alone and lost. 29.42% were with at least one other person in the room and won while 38.24% were not alone and lost. The third category is presented, this includes the people who chose to state their name. 10% of those who stated their name were alone and won. 90% that stated their name and were with at least one other person, lost.

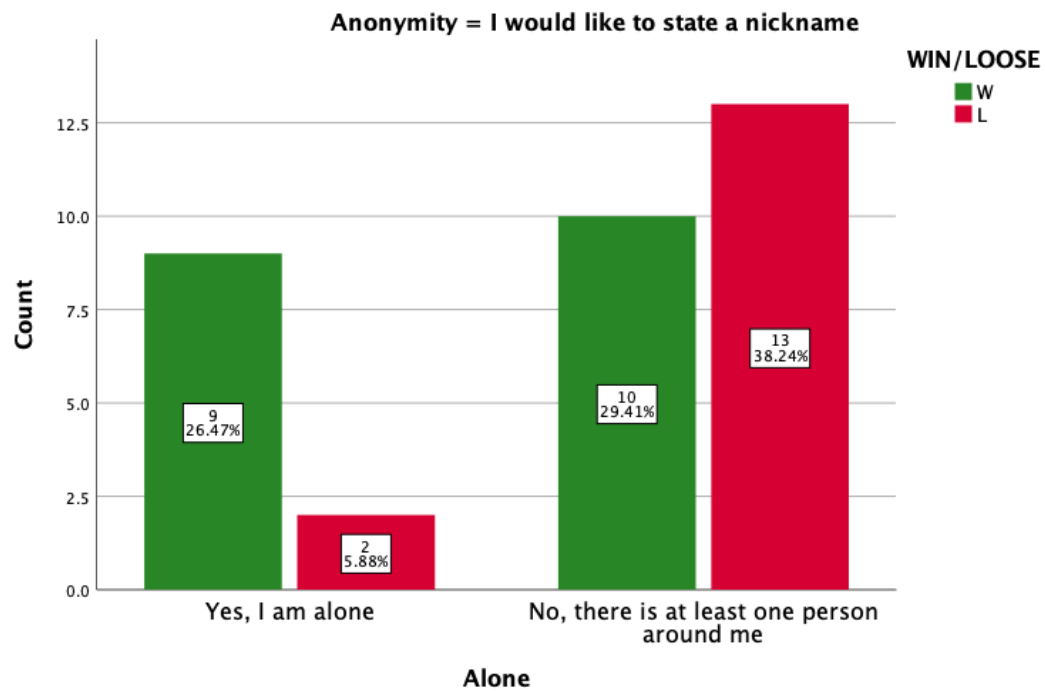


Figure A.14: People who stated a nickname - Were they Alone or not? - Did they Win or Lose ?

The statistical table which includes the detailed percentages for the above graphs is presented below.



Alone \* WIN/LOOSE \* Anonymity Crosstabulation

Anonymity				WIN_LOOSE		Total
				L	W	
I would like to keep my anonymity	Alone	Yes, I am alone	Count	68	46	114
			% within Alone	59.6%	40.4%	100.0%
			% within WIN_LOOSE	62.4%	71.9%	65.9%
			% of Total	39.3%	26.6%	65.9%
		No, there is at least one person around me	Count	41	18	59
			% within Alone	69.5%	30.5%	100.0%
			% within WIN_LOOSE	37.6%	28.1%	34.1%
			% of Total	23.7%	10.4%	34.1%
	Total	Count	109	64	173	
		% within Alone	63.0%	37.0%	100.0%	
		% within WIN_LOOSE	100.0%	100.0%	100.0%	
		% of Total	63.0%	37.0%	100.0%	
I would like to state a nickname	Alone	Yes, I am alone	Count	2	9	11
			% within Alone	18.2%	81.8%	100.0%
			% within WIN_LOOSE	13.3%	47.4%	32.4%
			% of Total	5.9%	26.5%	32.4%
		No, there is at least one person around me	Count	13	10	23
			% within Alone	56.5%	43.5%	100.0%
			% within WIN_LOOSE	86.7%	52.6%	67.6%
			% of Total	38.2%	29.4%	67.6%
	Total	Count	15	19	34	
		% within Alone	44.1%	55.9%	100.0%	
		% within WIN_LOOSE	100.0%	100.0%	100.0%	
		% of Total	44.1%	55.9%	100.0%	
I would like to state my name	Alone	Yes, I am alone	Count	0	1	1
			% within Alone	0.0%	100.0%	100.0%
			% within WIN_LOOSE	0.0%	100.0%	10.0%
			% of Total	0.0%	10.0%	10.0%
		No, there is at least one person around me	Count	9	0	9
			% within Alone	100.0%	0.0%	100.0%
			% within WIN_LOOSE	100.0%	0.0%	90.0%
			% of Total	90.0%	0.0%	90.0%
	Total	Count	9	1	10	
		% within Alone	90.0%	10.0%	100.0%	
		% within WIN_LOOSE	100.0%	100.0%	100.0%	
		% of Total	90.0%	10.0%	100.0%	
Total	Alone	Yes, I am alone	Count	70	56	126
			% within Alone	55.6%	44.4%	100.0%
			% within WIN_LOOSE	52.6%	66.7%	58.1%
			% of Total	32.3%	25.8%	58.1%
		No, there is at least one person around me	Count	63	28	91
			% within Alone	69.2%	30.8%	100.0%
			% within WIN_LOOSE	47.4%	33.3%	41.9%
			% of Total	29.0%	12.9%	41.9%
	Total	Count	133	84	217	
		% within Alone	61.3%	38.7%	100.0%	
		% within WIN_LOOSE	100.0%	100.0%	100.0%	
		% of Total	61.3%	38.7%	100.0%	

Figure A.15: Table Alone/ WL/ Anonymity

In the fourth questionnaire a combination of the previous two can be found. In the previous questionnaires, the goal was to test whether those characteristics can manipulate the online

behavior of people. There is also the will of identifying the strength of this manipulation. This was done, again, with the use of some opinion questions. The participants were asked to stated whether people would be more honest in the experiment if someone was supervising them. 32.72% answered "Definitely yes", 30.41% "Probably yes", 25.81% "Might or might not" and 11% "Probably not", as it can be seen in the graph [A.16](#). Then, participants were asked if they think that people would be more honest in the experiment if they would be facing potential social exposure and judgement . 29.03% answered "Definitely yes", 23.04% "Probably yes", 11.98% "Might or might not", 30.41% "Probably not" and 5.53% "Definitely not". The answers are visualized in the following graph, figure [A.17](#)

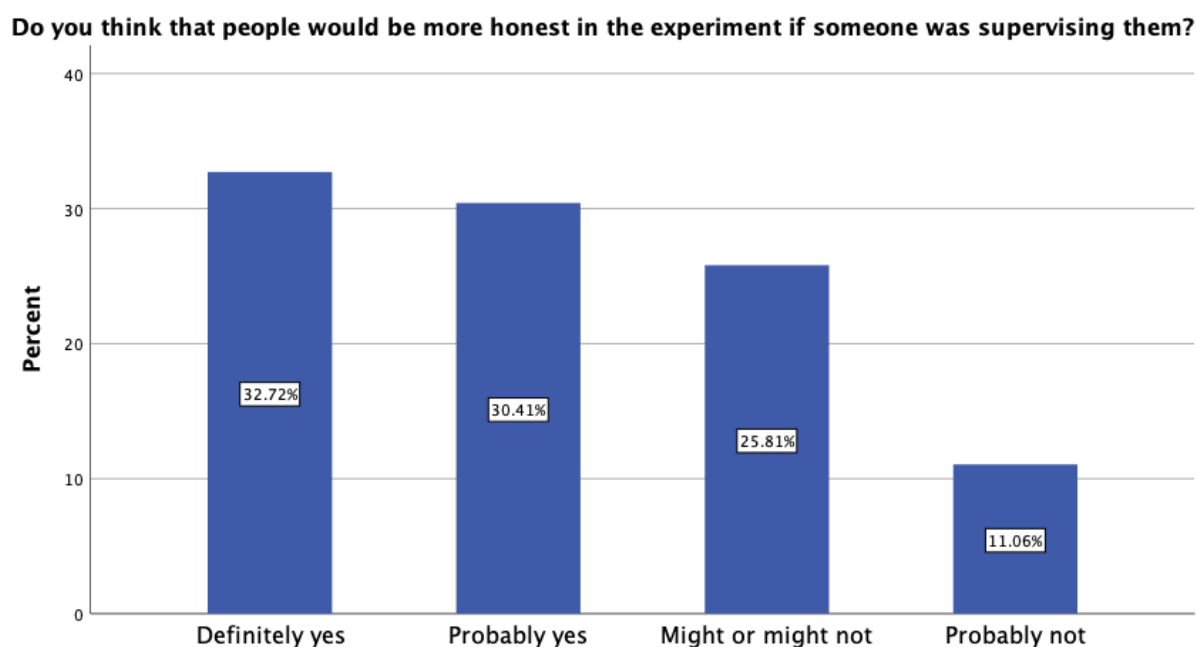


Figure A.16: Do you think that people would be more honest in the experiment if someone was supervising them?

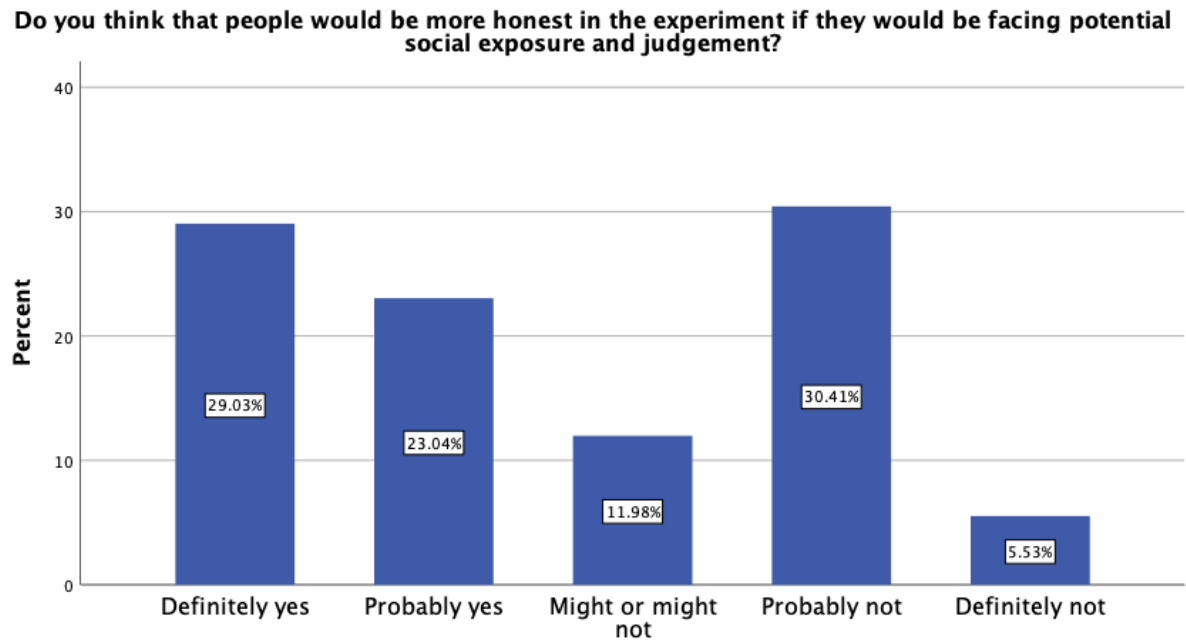


Figure A.17: Do you think that people would be more honest in the experiment if they would be facing potential social exposure and judgement?

Later, participants had to rank how uncomfortable the fact that the photo of "the watching eyes" made them feel. 21.66% answered "Not uncomfortable at all", 41.94% "A bit uncomfortable" and 36.41% "Very uncomfortable". Similarly, participants had to rank how uncomfortable the fact that the results would be presented to all participants made them feel. 31.80% answered "Not uncomfortable at all", 31.34% "A bit uncomfortable" and 36.87% "Very uncomfortable".

Following the combination of the results of the questions "Please rank how uncomfortable the fact that the overall statistics will be presented to all participants made you feel" and "Would you like to keep your anonymity, state your name or state a nickname?". The results of these two questions are combined with the main question of the questionnaire, whether they won or lost.

The following graph includes the opinion of the people who kept their anonymity on the question "Please rank how uncomfortable the fact that the overall statistics will be presented to all participants made you feel" and whether they won or lost. Out of all the people who kept their

anonymity, 17.92% stated that they were "Not uncomfortable at all" with the availability of the results and won and 8.67% lost. Out of all those people who kept their anonymity and said that they felt "A bit uncomfortable", 13.29% won and 20.23% lost. Last, out of all the people who kept their anonymity and said that they feel "Very uncomfortable" 5.78% won and 34.10% lost.

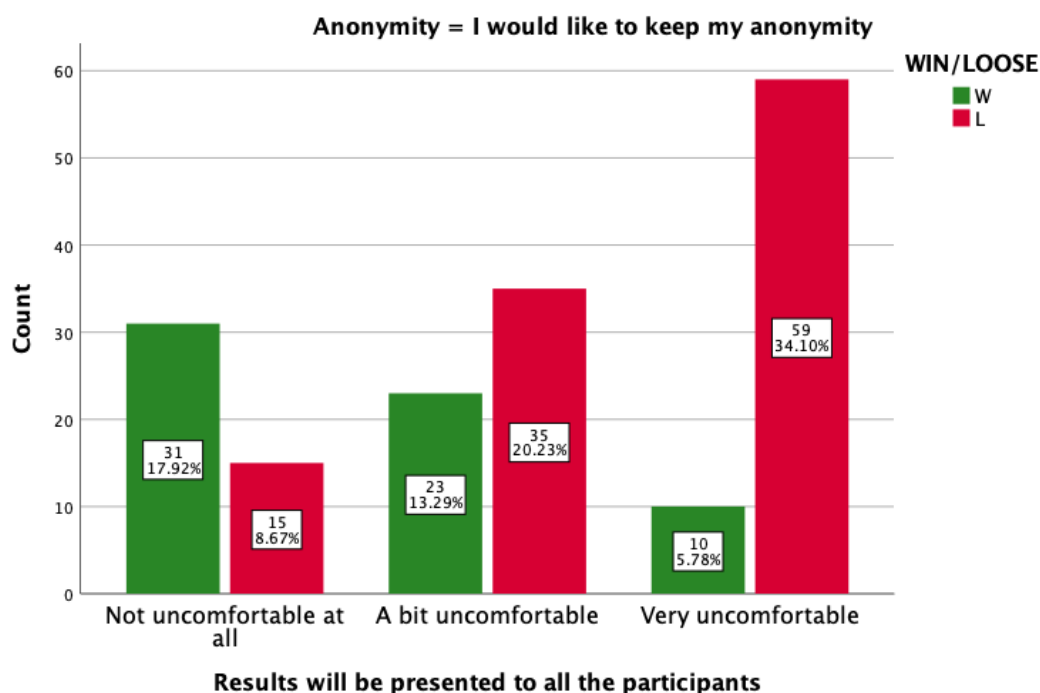


Figure A.18: Results will be available to all participants & Anonymity

Similarly, out of all the people who stated their name, 10% of the participants answered "Not uncomfortable at all" and lost. 10% stated that they were "A bit uncomfortable" with the availability of the results and won while 50% lost. 30% stated their name and said that they feel "Very uncomfortable" with the availability of the results and lost. Last, out of all the people who stated a nickname, 50% stated that they were "Not uncomfortable at all" and won while 14.71% lost. Out of the people who said that they felt "A bit uncomfortable", 2.94% won while 8.82% lost. 2.94% of those who stated a nickname and said that they feel "Very uncomfortable" won while 20.59% lost.

The next combination of results can be visualized in the next three graphs. In those graphs, one can find the combination of the results of the questions "Please rank how uncomfortable

the picture of watching eyes made you feel” and ”Would you like to keep your anonymity, state your name or state a nickname?”. The results of these two questions are combined with the main question of the questionnaire, whether they won or lost. The graphs are three because there is a different graph for each option (Keep their anonymity, State their name or state their nickname). Again, in this chapter the results are simply presented without any conclusions. In the following chapter, 7, the results will be analyzed and conclusions will be drawn.

The following graph includes the opinion of the people who kept their anonymity on the question ”Please rank how uncomfortable the picture of watching eyes made you feel” and weather they won or lost. Out of all the people who kept their anonymity, 15.61% stated that the picture of watching eyes made them ”Not uncomfortable at all” and won, while 5.20% of this group, lost. Out of all those people who kept their anonymity and said that they felt ”A bit uncomfortable”, 16.18% won and 23.70% lost. Last, out of all the people who kept their anonymity and said that they feel ”Very uncomfortable” 5.20% won and 34.10% lost.

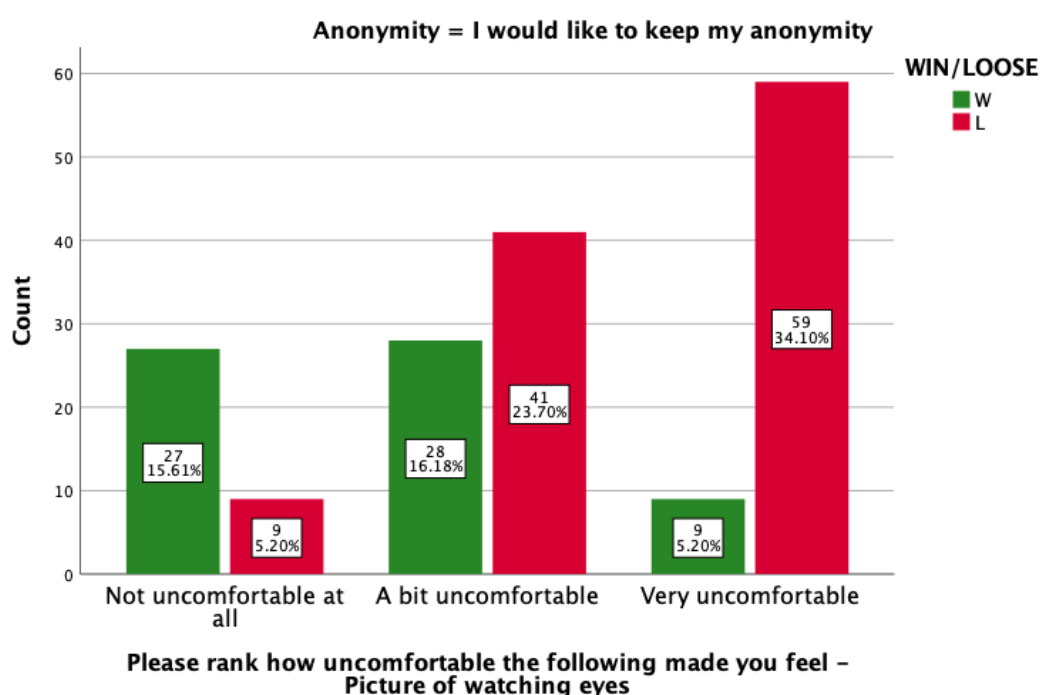


Figure A.19: Picture of watching eyes & Anonymity

The last graph includes the opinion of the people who stated their name on the question ”Please

rank how uncomfortable the picture of the watching eyes made you feel” and weather they won or lost. Out of all the people who stated their name, 20% said that they feel ”Not uncomfortable at all” and lost, 10% stated that they were ”A bit uncomfortable” with the picture of watching eyes and won while 40% lost. 30% stated their name and said that they feel ”Very uncomfortable” with the availability of the results, lost.

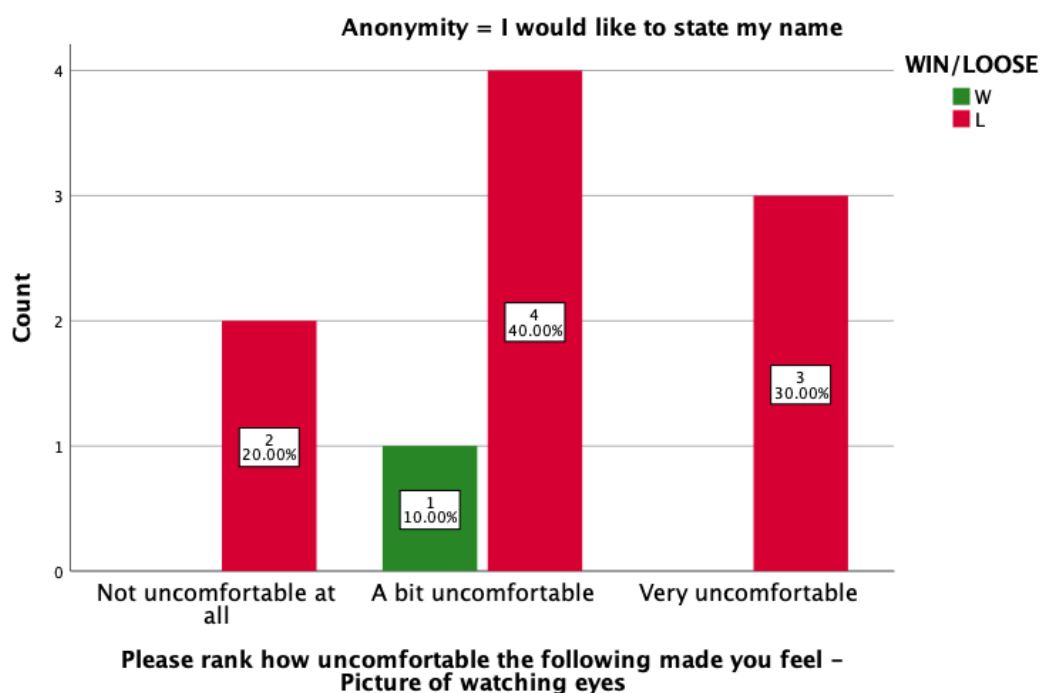


Figure A.20: Picture of watching eyes & Name

The following graph includes the opinion of the people who stated a nickname on the question ”Please rank how uncomfortable the picture of watching eyes made you feel” and weather they won or lost. Out of all the people who stated a nickname, 26.47% stated that they were ”Not uncomfortable at all” with the picture of watching eyes and won while 5.88% lost. Out of the people who said that they felt ”A bit uncomfortable”, 26.47% won while 23.53% lost. 2.94% of those who stated a nickname and said that they feel ”Very uncomfortable” won while 14.71% lost.

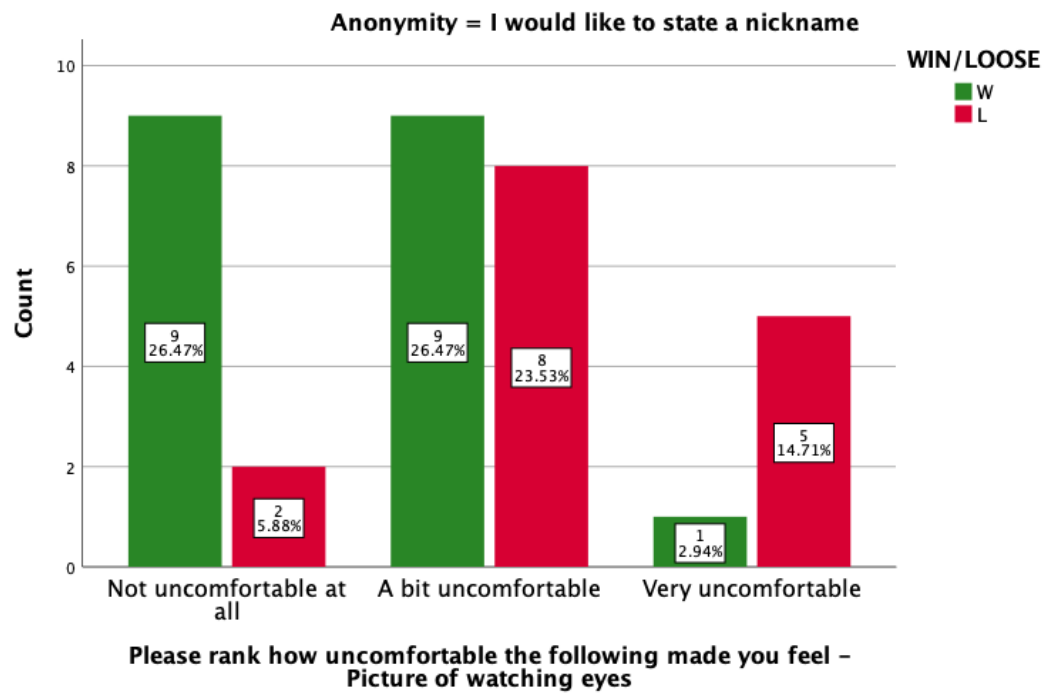


Figure A.21: Picture of watching eyes & Nickname